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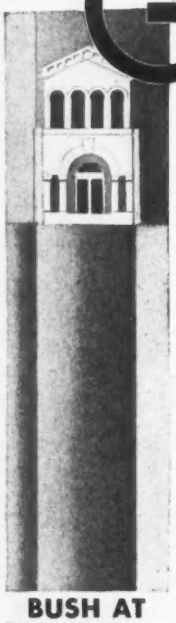

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VOLUME XXXVI JANUARY, 1932 No. 1

URINARY INFECTIONS: THEIR CLASSIFICATION*

By FRANK HINMAN, M. D.
San Francisco

DISCUSSION *by Donald A. Charnock, M. D., Los Angeles; Charles P. Mathé, M. D., San Francisco; Lionel P. Player, M. D., San Francisco.*

NEPHRITIS and pyelonephritis are unsatisfactory representatives of two distinct groups of renal inflammation. The one refers to medical diseases of the kidney, the other to surgical, but the terms are not specific. Each covers many widely differing conditions and each group presents great difficulty in classification of these various diseases into recognizable and well-defined entities. Everyone should be familiar with the difficulties involved.

Fundamental differences of cause, mode and source of infection and of the clinical course and findings in relation to pathological changes establish a basis of division and subdivision, but in neither group can an etiological, anatomical, pathological or clinical basis of classification exclusively be followed to a satisfactory conclusion. But medical and surgical diseases are too complex and in themselves too closely interrelated to permit classification except on general lines. Transitional stages from one type to another are frequent.

The division into medical and surgical is itself misleading and nosologically incorrect. Some of the medical diseases often require surgery. In many surgical diseases operation is never indicated. The surgical group may be defined as including all renal lesions due to direct bacterial invasion, the medical group, degenerative inflammatory and vascular types of change secondary to toxins of the blood stream, whether chemical, bacterial, or other noninfectious cause. The origin of an infectious nephritis may be the same as an acute glomerulonephritis. Why the streptococcus, say of scarlet fever, at one time invades renal tissue, at another injures it indirectly through toxins (or antitoxins) is not known. Pyogenic infections may produce metastatic lesions of various types in the kidney or set free toxins that give rise to various forms of Bright's disease. An infectious fever may give rise to a specific focal infectious nephritis, or be the starting point of an acute or chronic nephritis, noninfectious, or if prolonged of a nephrosis, also noninfectious. The causes of the essential or nonrenal hypertensive group are unknown. Focal infection, therefore, is a very important factor of origin of both infectious and noninfectious lesions.

Nevertheless this division of inflammatory and degenerative renal lesions into an infectious or surgical group and a noninfectious or medical group is fundamental in diagnosis. The object of further discussion here is subdivision of the infectious group by classifying its many heterogenous types in such a way that they may be differentiated and recognized clinically.

Classification of Renal Infections (Surgical).—Any disease or abnormality of the urogenital tract has a tendency to produce urinary stasis or obstruction. Whenever this occurs, no matter how temporary, infection is imminent. These infections may come from the outside or from a lower portion of the tract, ascending; from the lymphatics, as cecum to right kidney, or from the blood, as in focal infections. It is not possible to determine always the source of infection. All three routes may be active together or variously at different times. But the important factor is lowering of local resistance. Trauma of any kind may do the same thing and an infection occur which would not have occurred without it. Any condition which impairs renal resistance as renal stone or faulty hygiene is an accessory of infection. A good primary division of renal infections, therefore, is into the following two types:

Type A.—Infections resulting from organisms which reach the kidney through the blood stream in overwhelming numbers, particularly virulent or specifically disposed.

Type B.—Infections resulting because of some urogenital abnormality or condition which acts to lower local resistance, or to furnish a portal of entry.

THREE CLINICAL GROUPS OF RENAL INFECTIONS

Classification into Type A depends on whether the urogenital tract is normal, and into Type B whether the abnormality is a factor of incidence. Particularly virulent overwhelming infections occur with marked abnormalities in which the abnormality probably had nothing to do with the onset. Only when the abnormality is an accessory of infection is it significant. With these facts and characteristics in mind, three distinct clinical groups of renal infections are recognizable:

I. The specific group.
II. The focal group, or Type A infections.
III. The urogenital group, or Type B infections.

* Read before the Section of Urology at the sixtieth annual session of the California Medical Association at San Francisco, April 27-30, 1931.

Pathologically, lesions in any one of these groups may be indistinguishable. Any pathological classification unrelated to clinical conditions is of little practical value. Pyelitis and pyelonephritis are too general and indefinite, not much better than the term "pyuria"; but qualifying each with the specific, focal or urogenital factor, which is directly related, will give definition and clinical meaning.

The pathological types of infection are generally grouped as follows:

Cystitis	Suppurative lesions
Cystopyelitis	Acute suppurative nephritis
Pyelocystitis	Multiple cortical abscesses
Pyelitis	Carbuncle
Pyelonephritis	Perirenal abscess
Acute	Perirenal and pararenal lesions
Chronic	Rare types of lesions
Atrophic	Cystica
Infected hydronephrosis	Granulosa
Pyonephrosis	Leukoplakia
Septic infarction	Malakoplakia

Only exceptionally do these lesions have definite clinical recognition. By qualifying the presumptive pathological lesion, which is indicated by the complete clinical and urological study, with an etiological factor of incidence also indicated by this study, accuracy of diagnosis, success in treatment, and a mutual basis of understanding is secured such that one doctor will know what the other one is talking about.

I. THE SPECIFIC GROUP

The specific group of renal infections includes those infections characterized by the causative agent as: (1) Renal tuberculosis. (2) Gonococcal nephritis. (3) Actinomycosis. (4) Syphilis (nephrosis). Everyone understands what is meant by the diagnosis of tuberculous pyelonephritis or pyonephrosis.

II. THE FOCAL GROUP

Relatively few pyogenic organisms invade the urinary tract. *Bacillus coli communis* and allied groups (such as Proteus vulgaris, aerogenes capsulatus, fecalis alcaligines, and pyocyaneus) predominate. Streptococcus and staphylococcus are relatively infrequent, but it is uncertain how infrequent. Both experimental and clinical results indicate it may at times be the primary invader with a colon-like organism secondary and outgrowing it (Hayden, Bumpus), but Helmholz was unable to produce colon infections in rabbits which had previously been inoculated with cocci. Here the colon did not outgrow cocci.

Limitation of Bacteriological Study.—Bacteriological studies of chronic pyelonephritis, particularly that secondary to urogenital obstruction, often give varying findings. Mixed infections occur. Take the following three cases, shown in Table 1, studied ten years ago, when bacteriological studies and vaccines were popular: Cases 1 and 3 show five different organisms; Case 2, four; and mixed infection is frequent in the others. Knowledge of the type of organism is important in the interest of a complete diagnosis, but not nearly so significant as knowing that organisms are present. The fact that it is a bacillus or coccus and the type of either is a matter for due consideration only after one has determined whether or not its presence is secondary to accessory urogenital conditions. The only renal infections in which knowledge of coccus or bacillus invasion is of great significance is in a subgroup of the focal group under discussion. Unfortunately it is just in this very subgroup that the urine most frequently is sterile and negative. The characteristic lesion in the kidney of this subgroup is due to a coccus, but as the lesion is cortical and does not communicate with the tubular system or pelvis, the urine is negative. The only time, therefore, when determination of the type of pyogenic organism in the urine would be of real diagnostic value, the organism does not reach the urine. At other times when the urine is loaded with organisms, the type of organism, whether bacillus or coccus, has no immediate significance of the nature of the renal lesion. At times cocci invade tubules and pelvis, and bacilli can produce cortical abscesses. Glomeruli and interstitial tissues, the favorite field for cocci, are not immune to bacillary invaders. Therefore the first consideration is not so much the type of organism as the presence of organisms and their probable source.

The blood stream is invaded by organisms from many different sources. The specific group given above is characterized by renal involvement with a specific organism (tubercle bacillus, gonococcus, etc.). The focal group is characterized by renal involvement with pyogenic organisms not as a rule intercurrent but late, even months after the acute stage of the original infection and this original focus may have been so transitory as to have been almost forgotten. Foci need not persist.

These focal sources of renal infection may for convenience be considered in relation to four systems: integumentary, respiratory, digestive, and miscellaneous sources. Integumentary foci are: infected wounds, boils, furuncles and carbuncles, erysipelas, impetigo, osteomyelitis, etc.

Respiratory foci are: otitis, mastoiditis, rhinitis, bronchitis, bronchopneumonia, pleurisy, etc.

Digestive foci are: angina, tonsils, teeth, appendix, gall-bladder, colon, visceral purpura, bowel stasis or faulty hygiene, etc.

Miscellaneous foci occur as pus tubes, etc. It is possible for infection anywhere to be a source of renal infection.

Streptococci and staphylococci (pneumococci) dominate integumentary and respiratory tract infections and such infections of the digestive system as angina tonsillitis and infected teeth; but cannot compete with bacillary or colon-like organisms in the remaining alimentary tract conditions which act as foci. The bacillus group also dominates urogenital types almost 90 per cent.

Although the mechanism of renal invasion from urogenital foci may be hematogenous or blood-borne in many cases just as from integumentary, respiratory and digestive system foci, this bacillary predominance and the difficulty often of determining whether renal involvement is hematogenous, lymphogenous or ascending makes it logical to consider all urogenital foci, whether

TABLE 1.—*Bacteriological Study of Three Cases*

Date	B. coli	Subtilis	Alcaligines	Aerogenes	Staphylococcus		Streptococcus		Sterile
					Albus	Aureus	Non-hemolytic	Viridans	
I. Young									
July 7, 1919	+								
August 9, 1919					+		+		
August 14, 1919						+			
August 16, 1919							+		
August 23, 1919								+	
August 29, 1919	+								
October 4, 1919	+				+				
November 20, 1919					+				
November 22, 1919						+			
December 3, 1919					+				
December 24, 1919					+				
January 3, 1920									+
January 5, 1920	+								
II. McAffee									
January 10, 1918					+				
January 22, 1918	+				+				
March 21, 1918	+				+		+		
September 23, 1919			+						
October 31, 1919			+		+				
January 6, 1920									+
III. Tyler									
August 5, 1918	+								
October 1, 1918	+	+			+				
October 7, 1918	+								
October 10, 1918	+								
October 15, 1918	+								
October 17, 1918	+		+		+				
November 8, 1918	+						+		
November 13, 1918	+								
December 9, 1918					+				
December 16, 1918					+				
December 28, 1918									+

metastatic or not, in one group as accessories of infection along with obstruction or trauma. The route of infection is relatively unimportant anyway compared to the source. With the understanding that foci of infection of the urogenital tract below the kidney may feed organisms into the blood stream as other infections do, to be carried to the kidney and infect it, yet for the practical purpose of classification, these foci will be considered as a subdivision of urogenital sources of renal infection under the next or accessory group. The following outline will indicate their scope:

Urethral (instrumental injury with chill and sepsis, marital urethral injury, ascending from the outside—contamination from diapers in children, and from leukorrhea in women).

Prostatic and seminal vesicular (prostatitis and seminal vesiculitis).

Vesical (cystitis, submucous ulceration, pericystitis—ureteral reflux accompanying disturbed mechanism of urination).

Ureteral (ureteritis, periureteritis, stricture—reflux or obstruction).

Pelvic (pyelitis and peripyelitis, abscess—pyelovenous backflow).

Parenchymal (reinfection and exacerbations, intrarenal ascension).

Clinically, three characteristic groups of infections result from invasion of the normal kidney by organisms from the various above sources. The focal group, therefore, may be definitely subdivided into:

1. Pure coccal suppurative lesions.

2. Obscure forms of bacillary or mixed infection.

3. Intercurrent infection.

Subdivision 1. *Pure Coccal Suppurative Lesions.*—Pure coccal cortical infections form a distinct clinical entity. They commonly occur from streptococci or staphylococci of integumentary foci. They produce renal suppuration which may be diffuse; diffuse suppurative nephritis, local; multiple cortical abscesses and conglomerate, carbuncle. At the onset they are acute with hyperpyrexia, leukocytosis, and general intoxication. The urine is almost always negative, even to culture in the acute stage and frequently throughout the course of the disease which may last for months. They are usually unilateral. Sometimes, then, nephrectomy is life-saving. If not fulminating they may become chronic with frequent acute exacerbations, at which times renal tenderness may be marked, or they may go on to slow healing. These lesions are the commonest cause of perinephritic abscess.

The pathological terms define satisfactorily these clinical types of pure coccal suppurative infections. It is not often, however, that the surgeon can specify definitely before operation whether the lesion is a diffuse suppuration, multiple abscesses of the cortex, or a large carbuncle. No doubt, also, many of these patients go to healing without operation. But as a clinical group it is quite definite and best indicated clinically by associating the terms "coccal" and "suppuration" because other suppurative lesions of the kidney occur and other types of coccal infections occur.

Subdivision 2. *Obscure Focal Infections of Bacillary or Mixed Invasion.*—The focal renal infections form a heterogeneous group impossible of definite classification. They are recognized and diagnosed more through methods of exclusion than otherwise. The urogenital tract must be normal or any abnormality proven to be unrelated. They may be acute but, unlike the above cortical lesions of pure cocci, give immediate evidence in the urine by pus and bacteria. The bacillary infections in themselves, unlike the coccal, are never fatal at the onset. Unusually high temperatures occur. There is moderate to high leukocytosis. They tend to become chronic with periodic exacerbations. They are almost always bilateral. Removal of the focal infection early will cause them to disappear often without treatment. Otherwise atrophic changes develop with loss of renal function and renal insufficiency that during some exacerbation may develop into uremia.

These obscure cases without urogenital abnormality, which are also nonspecific and not of the pure coccal suppurative type, are difficult to recognize as well as classify clinically, but undoubtedly some attempt should be made to group different types of these focal infections. The terms "acute," "chronic" or "atrophic" pyelonephritis, qualified by the term "focal," will be a beginning in this much needed organization. When the clinical and urogenital examination indicates the type of focal invasion, this should also be qualified in the diagnosis.

Subdivision 3. *Intercurrent Infections.*—Intercurrent renal infections are almost always transitory and manifest as a rule only at the most active stage of the infection of origin, disappearing with convalescence. The kidney succumbs temporarily to organisms in overwhelming numbers. Included are those types of excretory focal nephritis occurring at the height of many infectious fevers—typhoid, scarlet, rheumatic, and relapsing fevers and pneumonia, measles, malaria and influenza, as well as other severe infections—as angina, tonsillitis, erysipelas, etc.

These infections are usually quite definite clinically and the term "pyelonephritis," intercurrent, with typhoid, influenza, etc., definitely characterizes the condition. Typhoid pyonephrosis is likewise specific.

III. THE UROGENITAL GROUP

In point of frequency, renal infections of accessory urogenital origin far outnumber infections of the specific and focal groups combined. So frequent and imminent are infections that the urologist must use the greatest care and precision with all methods of examination and treatment. Infection any place in the tract tends to spread to the kidney. Urinary stasis or obstruction is a common predisposing factor. Conditions of the focal group, particularly of the nonsuppurative subgroup of obscure infections, often coexist with urogenital conditions. Removal of the cause of obstruction may fail to clear the renal infection until a focus has been removed. But many renal infections are solely dependent on some accessory condition of the urogenital tract. Foci may be insignicant. The accessory conditions may be subdivided so that certain distinct clinical groups of renal infection will correspond with these subdivisions into (1) obstructive, (2) metastatic, (3) traumatic, and (4) transurethral conditions.

Subdivision 1. *Urinary Obstruction or Stasis.* As already stated, obstruction or stasis of urine anywhere in the tract is a common cause of renal infection by lowering renal resistance. The source of the organism is usually obscure. It may be of metastatic origin as in the focal group. It may reach the kidney by way of the blood stream through errors of intestinal hygiene. Bowel stasis or diarrhea may set colon bacilli free in the blood. A direct lymphatic path from the cecum to the right kidney is known anatomically, and at times the organism may follow this route. It may ascend from an infection of the lower tract by way of the ureteral lumen or such infections may feed organisms into the blood stream. These obstructions need not be continuous or prolonged. When temporary, as in vesical retention, infection may follow. For clinical reasons it is important to know whether the obstructive condition is of the lower tract, urethra and bladder, or of the upper tract, ureter and pelvis, and whether or not it is mechanical, adynamic or functional.

Not all of these infections are associated with changes of back pressure. Otherwise the term "infected hydronephrosis" could be generally applied. Pyelonephritis obstructive, however, is spe-

cific and designation of the location or type of obstruction would often much better qualify the pathological diagnosis.

Subdivision 2. *Metastatic Infection.*—It is a common experience in practice for infection of lower portions of the urogenital tract to spread to the kidney. By what route this invasion of the kidney occurs is not always at all clear. There may be some obstruction with lower tract infection that may be temporary or partial, as in many cases of prostatitis, so that in some cases an ascending invasion of the kidney may occur. Often the urogenital infection is not obstructive and then the invasion of the kidney is probably by way of the blood stream. At times several combination routes no doubt may occur to produce the renal infection. Because of the obscurity often present in these cases, designation of a metastatic pyelonephritis would have a definite meaning and the route of invasion is of little significance anyway. The term would specify that the infection of the kidney is secondary to infection in the urogenital tract, and the seat of this infection could often be designated to advantage as prostate, bladder, or ureter.

Subdivision 3. *Traumatic Infections.*—An infection will often arise in a kidney due to trauma from within, such as stone without obstruction, or to trauma or injury from without. In order to avoid confusion, the direct relation of trauma to the onset of infection should be clear. Many times trauma, such as a blow or fall, will precipitate an infection indirectly so that other etiological factors than trauma would have to be given due consideration in the diagnosis.

Subdivision 4. *Transurethral Infections.*—There are three definite types of transurethral invasion of the urogenital tract that often lead to renal infections. There can be no doubt that infection often ascends the short urethra of the female from the outside. The first effect, therefore, is an inflammation of the bladder or cystitis. How the infection reaches the kidney from the bladder is of little clinical importance. The source of the kidney infection has been the urethra and, therefore, prevention of recurrence of renal infection must be directed to the urethra. There are two distinct clinical types of ascending urethral infections which may be designated, first, the marital type, and second, the contamination type.

The marital type is directly related to intercourse. Trauma to the urethra enables organisms to ascend or they may be mechanically worked up the urethra at the time, setting up a definite cystitis. Defloration cystitis is probably identical with marital cystitis of this type and not to invasion of the blood stream by organisms from the torn hymen as was originally supposed. That the organisms can ascend the urethra either mechanically at the time of intercourse or later because of trauma to the urethra when produced seems proven by a number of clinical cases like the following:

The patient was a nurse and her husband a doctor, so that their statements and observations are of additional value. She had had recurring attacks of pyelonephritis which would invalid her for periods of two to six weeks once or twice a year for many years. She had been under treatment by pelvic lavage, ureteral dilatation, and general medical care for the elimination of all sorts of foci or other accessory causes. The urogenital tract on repeated examination appeared perfectly normal throughout. Ureteral dilatations had been followed vigorously without any permanent relief. Finally, the association of the onset of attacks to the marital relation was observed and precautionary measures instituted, such as vaginal douches before and the immediate instillation of a one per cent solution of mercurochrome into the bladder upon the first premonition of bladder irritation following intercourse. These prophylactic measures have prevented any attack of pyelonephritis of any kind for over four years.

The contamination type of ascending infection of the urethra must be common in many girl infants and, of course, prophylactic measures in regard to changing of diapers, douches, and local cleanliness are obvious. Such an explanation of some of the pyurias of childhood is supported by the greater frequency in girls and the fact that in about 50 per cent of these cases the infection is limited to the bladder, as proved by cystoscopy and ureteral catheterization, at onset or in the acute stage. With cystitis there is urinary dysfunction and all the factors necessary for a reflux to the kidney.

The third transurethral type of origin is instrumental. The urethral chill is probably a direct invasion, but in a very large percentage of cases inflammation of the kidney follows. Naturally organisms in the urethra that gain the blood stream sufficiently to produce chill could be carried by the same instrument into the bladder. It is, of course, well known that the normal bladder cannot be easily infected and, therefore, other associated lower tract conditions must be looked for in this type of case. The clinical designation of pyelonephritis transurethral is definite.

It is at once evident that one or more of the three clinical sources of infection may be associated. It is particularly common for urogenital and focal conditions to coexist, but it would seem a distinct clinical advantage to attempt a definite combined etiological-pathological classification and specify the presumptive renal lesion with its presumptive etiological factor. Specific, focal and urogenital pyelonephritides form three well marked definite groups of renal infection.

384 Post Street.

DISCUSSION

DONALD A. CHARNOCK, M.D. (523 West Sixth Street, Los Angeles).—Infectious diseases of the urogenital system have long been unsatisfactorily catalogued. In this paper Doctor Hinman has dispensed with the necessity of philosophizing upon academic questions and has confined his classification to descriptive terms regarding the lesion itself.

The first class deals with the small group of specific invaders and needs no comment. The second group describes lesions which arise from infection present outside the urinary tract. Group three in-

cludes the various types initiated by infection present within the urinary tract.

The term "pyelitis" long ago came to be used as a general classification for any form of urinary infection. I do not think this gives us an adequate description of the many forms of infection within the urinary tract. In Doctor Hinman's classification, in addition to the type of lesion, we are given the method of invasion and also the area responsible for the infection. The value of this clear-cut classification is apparent when we consider the necessity for satisfactory hospital records and the opportunity for clearly defined descriptions in referring patients to other consultants. In place of classifying a lesion under the general term of pyelonephritis or pyelitis we can now say, for example: Transurethral pyelonephritis (instrumental) which will immediately explain the case as one of renal infection with the primary focus in the urethra due to instrumentation.

*

Charles P. Mathé, M. D. (450 Sutter Street, San Francisco).—We are greatly indebted to Doctor Hinman for his comprehensive clinical classification of renal infections into three distinct groups, viz., specific, focal, and urogenital. The necessity of classification at the present time is indeed very great in order that urologists may have a mutual understanding of how to classify the various infections that we encounter daily in the kidney.

The diagnosis of the focal group of coccal infection of the kidney; acute suppurative nephritis, single and multiple cortical abscess formation and renal carbuncle and those of the renal loge, paranephritis, perinephritic abscess, etc., has always been quite obscure because of the paucity of urinary findings as compared to the severity of the patient's illness. In these cases very little evidence of infection can be found in making a routine examination of the urine. It has been my experience, however, that centrifugalization of the urine collected over a long period of time will often reveal the invading staphylococcus and is of great significance in aiding in the diagnosis of these lesions. They are more often found in cortical lesions of the kidney and less readily encountered if the infection is in the perinephritic tissues. In these cases the history of preëxisting foci in the skin, such as boils, furuncles, carbuncles, paronychia, etc., is of great significance. If the infected embolus lodges in the end arteries of the glomeruli, suppurative nephritis, cortical abscess, or renal carbuncle results. On the other hand, if the staphylococci lodge in the terminal arteries in the perirenal fat, perinephritic abscess develops. Perinephritic abscess may also be formed from direct extensions of a cortical abscess through the kidney capsule or by way of the lymphatics. The significance of early diagnosis of acute suppurative nephritis was pointed out by Brewer in 1906, who recommended early nephrectomy before involvement of the opposite kidney had taken place. It is very important to distinguish between acute suppurative hematogenous nephritis due to the staphylococcus and severe acute pyelonephritis due to the colon bacillus. Early nephrectomy is usually always indicated in the former, whereas renal drainage and lavage through the ureteral catheter is adequate in the latter.

The great incidence of infection of the urethra, prostate and seminal vesicles favor renal infection, often acting as a focus of pyelonephritis. This was strongly emphasized by Professor von Lichtenberg and myself in papers delivered before the American Urological Association in 1929. The relation of infections of the gastro-intestinal tract, gall-bladder, appendix, etc., has long been realized and this entrorenal syndrome was strongly emphasized by Heitz-Boyer a number of years ago. Any treatment directed to relieve renal infection, in order to be efficacious must also be directed toward eradicating all possible foci of infection elsewhere in the body.

Doctor Hinman has done well to emphasize the rôle of congenital and acquired urinary obstruction and stasis in the production of renal infection. Back pressure in the kidney not only may lower its local resistance, making it more susceptible to infection, but may also cause invasion of the renal cortex by organisms that had existed in the pelvis and collecting tubules for years. Thus, a pyelonephritic infection which had not been severe and had caused little appreciable damage to the kidney may extend to its periphery and invade the parenchyma forming numerous abscesses which result in destruction of this organ, thus necessitating nephrectomy.

*

Lionel P. Player, M. D. (384 Post Street, San Francisco).—The author's classification gives surgeons a means of communicating their findings and diagnoses clearly and intelligently. Doctor Hinman's paper is the most concise and comprehensive, yet simple of any offered, to my knowledge, in the literature, and I wish to express my appreciation of his very excellent contribution.

An outline for the classification of urinary infections, may I suggest, should embody the following:

1. Type or types of organisms.
2. Origin of organisms, *i. e.*, skin, sinuses, tonsils, etc.
3. Mode of invasions, *i. e.*, hematogenous, lymphogenous by continuity of tissue or from contiguous tissues.
4. Areas or points infected in the particular organ attacked by these organisms or their toxins.
5. Effect on the organ itself.
6. Effect on contiguous and connecting structures and the general system.
7. Previous knowledge of the general or selective action of these bacteria and their toxins. With these data in mind in a classification as an aid to the various methods of diagnosis, the more apparent and also the obscure lesions due to urinary infections would be recognized more readily.

LENGTHENING OF THE LOWER EXTREMITIES*

By LeRoy C. Abbott, M. D.
San Francisco

Discussion *by George H. Sanderson, M. D., Stockton; H. D. Barnard, M. D., Los Angeles; S. L. Haas, M. D., San Francisco.*

THE purpose of this article is to describe methods of operative lengthening of the bones of the lower extremity which were developed by the writer † at the Shriners' Hospital for Crippled Children in St. Louis. During the past six years these methods were used in a series of seventy-three children in whom shortening was due to infantile paralysis, congenital malformation, and destructive disease of the hip and knee joints. In forty-eight cases the tibia and fibula were lengthened, while in the remaining twenty-five cases the lengthening was done on the femur. The experience gained in this group of patients has been interesting and profitable, and the results have been decidedly encouraging.

These methods are based on three fundamental principles of bone lengthening, which are as follows: (1) To lengthen the bone, traction and countertraction must be taken directly upon that bone; (2) to overcome the elastic resistance of the soft parts, this traction must be of the slow,

* Read before the General Surgery Section of the California Medical Association at the sixtieth annual session at San Francisco, April 27-30, 1931.

† The writer is indebted to his former associates, Dr. C. H. Crego and Dr. A. O. Adams, for their aid in the development of the apparatus for lengthening of the extremities.

continuous type; and (3) to prevent harmful pressure on soft parts with sloughing of the skin and infection of the bone, accurate contact and alignment of the fragments must be maintained during the lengthening process. The first two principles have been emphasized by Putti in his article on the "Operative Lengthening of the Femur." The importance of the third principle has been stressed in our previous publications on this subject, and its observance is essential for successful lengthening without the development of serious complications.

Theoretically the above principles may be realized by osteotomy of the bone, insertion of pins through the upper and lower fragments, and the application of a special apparatus to provide traction and control while the bone is being lengthened. The practical application of these principles in lengthening of the tibia and fibula has led to the development of a standard method which has been used with uniform success in our clinic and in other clinics in various parts of the country. In lengthening of the femur, however, we have been less fortunate because we have experienced great difficulty in devising apparatus which will maintain alignment of the fragments. In attempting to overcome this difficulty we have developed a number of methods. Satisfactory lengthening and fair alignment can be secured with any of them. With no one of them, however, have we been able to maintain the same uniform contact and alignment of the fragments as in lengthening of the tibia and fibula.

In the following paragraphs, therefore, we shall describe in detail our method for lengthening of the tibia and fibula, but in lengthening of the femur we shall confine our remarks to a general discussion of the various methods employed, emphasizing the advantages and disadvantages of each.

LENGTHENING OF THE TIBIA AND FIBULA

The procedure for lengthening of the tibia and fibula has passed through several stages of development. Originally we used two pins which were drilled through the tibia above and below the site of an osteotomy. Traction was acquired by screw extension pieces fastened to the ends of the pins on both sides of the leg. A special splint with four turnbuckles, also attached to the ends of the pins, was utilized for control of the fragments. Failure to maintain alignment of the bone, however, led to the use of two additional pins which were turned through the upper and lower fragments, respectively. With four pins excellent control of the fragments was maintained and their application aided us in the elimination of the turnbuckles and complicated supporting splint. Furthermore, when four pins are employed, their diameters may be reduced and, consequently, the healing of the wounds is proportionately diminished.

THE APPARATUS FOR LENGTHENING OF THE TIBIA AND FIBULA

The apparatus for lengthening of the tibia and fibula consists of the following parts:

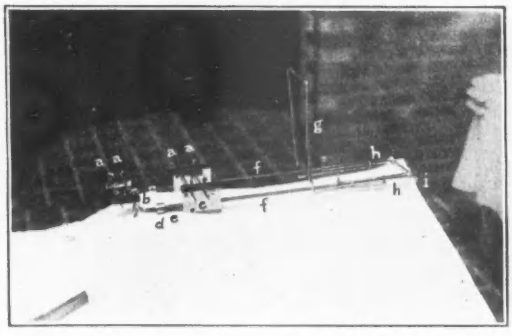

Fig. 1.—Apparatus for lengthening of the tibia and fibula. (a) Stainless steel pins fixed to the stationary and movable blocks b and c. (d and e) Thumb nut and spring fitting against movable block c. (f) Lateral threaded bars. (g) Foot support. (h) Telescopic metal tubes for lengthening of lateral bars. (i) Metal rod for fixation of lateral bars.

1. Four stainless steel drill pins.
2. An adjustable pin guide.
3. A combined traction and supporting splint (Fig. 1).

The pins are nine inches in length and one-eighth of an inch in diameter. They are made of stainless metal, because our experience has shown that there is less irritation to the soft parts than when ordinary steel is employed. The ends of the pins are drill-shaped so that they can be turned through the compact bone without preliminary drilling. This single operation reduces trauma to the soft parts and thereby minimizes the danger of infection.

To insure proper fitting of the traction apparatus it is essential that the pins be turned through the bone parallel to one another and in the same horizontal plane. For this purpose a special appliance termed a "pin guide" was devised. It may be described as consisting of two parts rectangular in shape, each six inches in length, which telescope at their inner ends. Each part has two holes drilled at its lateral extremity into which are fitted cylinders about three inches in length. The telescoping feature of the guide permits insertion of the pins in the upper and lower ends of the tibia in legs of various lengths.

The traction and supporting splint has been gradually modified until at present it consists of two threaded bars connected at their lower ends by an adjustable steel rod.** Attached to each bar are two solid blocks of metal; one is fixed to its upper end, while the other slides freely over its threaded surface. Each of the blocks, the stationary and the movable, have two holes drilled through their substance to receive the ends of the pins. Between the stationary block above and the movable block below a thumb nut and coil spring are attached. With tightening of the thumb nut the spring is forced against the movable block which moves downward and away from the fixed block. Thus the pins fastened to the blocks are separated and a telescoping of the fragments occurs with lengthening of the bones.

** This splint was devised by my former associate, Dr. C. H. Crego.

Two adjustable metal tubes slide over the lower ends of the lateral bars and are fitted with cylinders at their lower ends. After the lateral bars have been adjusted to the ends of the pins the metal rod is placed through the cylinders and held firmly by thumb screws. Thus a rigid and readily adjustable frame is secured. The entire apparatus is simple, easily applied, and possesses a high degree of mechanical efficiency.

THE DESCRIPTION OF THE OPERATION

A forty-eight-hour preparation of the skin of the leg and thigh is preliminary to the operation. On the operating table a tourniquet is applied above the condyles of the femur and the skin is painted with 70 per cent alcohol. The steps of the operation should be carried out in the following order:

1. Lengthening of the tendo Achillis.
2. Osteotomy of the fibula.
3. Insertion of the pins.
4. Application of the extension apparatus.
5. Osteotomy of the tibia.
6. Closure of the wound with drainage.
7. Removal of the tourniquet.
8. Suspension of the apparatus to the overhead bed-frame.

We advise lengthening of the tendo Achillis as a preliminary procedure in all cases except in those which have a calcaneus deformity of the foot. Otherwise the tension thrown on this structure during the process of lengthening forces the foot into equinus. The method is that used by Hoke.

Our next step consists of an osteotomy of the fibula through an incision anterior to the peroneal tendons. We also incise, transversely, the fascia covering the peroneal tendons and the bands which separate these tendons from the extensor longus hallucis anteriorly and the flexor longus hallucis posteriorly.

The pins are now inserted at the upper and lower ends of the tibia, the two above through the anterior third of the bone, and the two below through the middle third of the bone. These positions selected for the pins minimize the danger of injury to the anterior tibial vessels and nerve. With the skin pulled toward the center of the leg, the pin guide is placed firmly against the lateral aspect of the tibia and stab incisions are made at the levels of its four cylinders. The upper pin is then drilled through the tibia at right angles to the long axis of this bone and parallel to its anterior border. The upper cylinder of the pin guide is then passed over the projecting portion of this pin. The lower pin is then inserted by passing it through the lower metal cylinder of the pin guide and turning it through the bone. The two middle pins are now placed in a similar manner. All pins emerge through counter incisions on the inner surface of the tibia.

The lateral bars of the traction apparatus are now placed on the lateral aspect of the leg, fitting the drill holes of the stationary and movable blocks to the ends of the upper and lower pins. The lower ends of the lateral bars are then joined by the metal rod which is fixed in place by thumb screws.

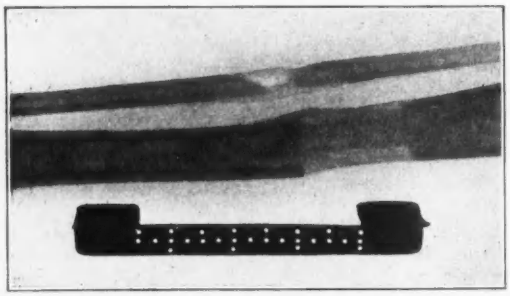

Fig. 2.—Anteroposterior roentgenogram of tibia and fibula two and one-half months after operation. A gain of one and three-fourths inches was secured.

The tibia is exposed through a gentle curved incision, five inches in length, made over the anterolateral aspect of the bone. To minimize the injury to the circulation of the periosteum this incision is carried down to the bone without dissection of the soft parts. The periosteum is then separated from the entire circumference of the tibia for a distance of about four inches, and with a motor saw two parallel cuts, about four inches in length, are made at its inner and outer surfaces. These cuts are joined at their upper extremities by a transverse section through the posterior cortex, and at their lower extremities by a transverse section through the anterior cortex. This provides a tongue on the lower fragment which lies behind the tongue on the upper fragment. At the middle of the wound the periosteum is incised transversely in its entire circumference, together with division of the interosseous membrane and deep fascia on the anterolateral aspect of the leg. The division of these fibrous structures decreases the resistance offered to lengthening of the bones.

The wound is closed in layers and at its upper end a small rubber tissue drain is inserted. The use of the drain prevents marked swelling of the leg subsequent to operation. The foot is suspended to the foot piece by means of an adhesive strip which is glued to its plantar surface. The apparatus is then attached to an overhead bed frame. This allows free motion of the knee throughout the process of lengthening.

POSTOPERATIVE LENGTHENING OF THE LEG

No attempt is made to lengthen the leg until all swelling has disappeared, which is usually at the end of the first week. The drain is removed in forty-eight hours.

Lengthening is begun by tightening of the thumb nuts an equal number of turns on the two sides. Measurements are then taken between the ends of the pins and recorded. On the second day a few more turns produce a little more separation of the fragments and again the measurements are taken. This procedure is carried out daily until the desired length is secured. The average daily gain is one-sixteenth of an inch,

and the entire time of traction is from four to five weeks. To provide a check on the length gained and the position of the fragments, roentgenograms are taken at intervals (Fig. 2).

The extension apparatus remains in place from eight to ten weeks. Upon its removal the leg is encased in a plaster of Paris cast. This cast is bivalved to allow dressing of the pin wounds and motion at the knee and ankle joints.

To determine the state of the repair process, roentgenograms are taken every two to three weeks. In the majority of cases sufficient callus has formed in four or five months to allow the patient to walk with a Thomas walking caliper splint. This splint is worn continuously for two or three months and then gradually discarded.

Your attention should be directed here to the importance of the care of the foot during the period of postoperative traction. Despite the lengthening of the tendo Achillis at the time of operation there is a tendency, during the process of stretching, for the foot to be forced into equinus. Moreover, the foot frequently assumes a marked valgus position, even if it had been stabilized previously. We deem it unwise, therefore, in dealing with cases of infantile paralysis, to stabilize the foot before lengthening of the bones is done. During the process of lengthening of the leg we aim to control the position of the foot as far as possible, but if unpreventable deformities arise we correct them by stabilization at a later date.

LENGTHENING OF THE FEMUR

In the first stages of our work on lengthening of the femur we attempted to use traction on one side of the thigh in a similar manner to that advocated by Putti. In our hands the method was unsatisfactory; first, because the pins were not secure and, second, because we were unable to control the position of the fragments. Consequently a procedure was devised similar to that used early in the development of a method for lengthening of the tibia and fibula. Two pins, three-sixteenths of an inch in diameter, were inserted in a transverse direction in the upper and lower ends of the shaft of the femur. The lower pin was introduced through a stab incision on the lower inner thigh three-fourths to one inch above the epiphyseal line. To avoid injury of the femoral and profunda vessels the upper pin was inserted through an incision made on the upper inner aspect of the thigh which exposed the inner border of the adductor longus muscle. The fascia overlying this muscle was traced inward until the femoral vessels were seen lying between this muscle and the inner surface of the femur. The vessels were retracted forward and the pin was then passed through the substance of the adductor longus muscle and turned through the bone and a counter incision on the outer aspect of the thigh. The femur was then exposed through an incision on its posterolateral aspect with separation of the biceps femoris and vastus lateralis muscles. After elevation of the periosteum about the entire circumference of the bone for a distance of four to five inches, a Z-shaped osteotomy was performed with a motor saw and osteotome.

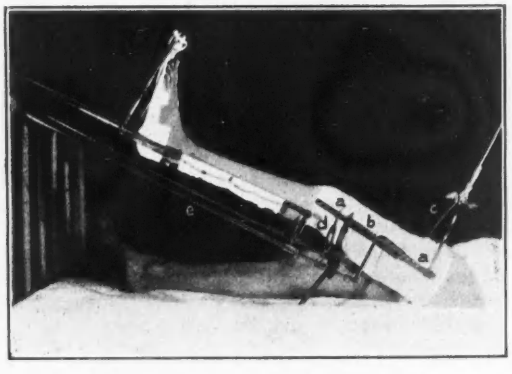

Fig. 3.—Apparatus employed in two horizontal pin method for lengthening of the femur. (a) Upper and lower pins. (b) Screw extension pieces attached to the ends of the pins. (c) Steinman stirrup for support of upper pin. (d) Turnbuckle for control of lower pin. (e) Supporting splint with knee flexion piece.

Traction was secured by screw extension pieces which were fastened to the ends of the pins on both sides of the thigh. The screw extension pieces also prevented lateral displacement of the fragments. Control of their position in the anteroposterior plane was facilitated by the use of a supporting splint, knee flexion piece, and turnbuckles (Fig. 3). The results secured in the fifteen cases operated upon were entirely satisfactory from the standpoint of lengthening secured. In one case we obtained as much as three and one-half inches. The chief difficulty was inability to maintain contact and accurate alignment of the fragments, particularly in the anteroposterior plane. In several cases a very considerable displacement occurred. Again there is a reasonable objection to this method because of the incision required to place the upper pin. A rather painstaking dissection must be carried out and the risk of infection of the wound is increased. Our experience with this method has shown that mild sepsis with long-continued drainage is prone to occur where the pins are inserted through incision and dissection.

Anticipating better control of the fragments, we used four small pins with the same traction splint which we now use in the lengthening of the tibia and fibula. We found, however, that the insertion of four pins parallel to one another and in the same horizontal plane in a very much shortened femur was a complicated procedure. While better control of the fragments was acquired in the two cases operated upon, we abandoned the method because of the technical difficulties of operation.

To avoid an incision on the upper inner thigh we transfixed the upper fragment in a vertical direction as advocated by E. C. Bull of San Francisco. Traction was then applied by screw extension pieces, the upper ends of which are fastened to the vertical pin while the lower ends are attached to two horizontal bars which are

fixed to two vertical uprights. Through perforations in their substances these vertical uprights are attached to the ends of the pins. The use of the vertical pin lessens the chances of displacement of the upper fragment in the anteroposterior plane, but it does not eliminate its deviation in a lateral direction. A further objection is that the wound in the region of the buttock may become infected, and in one of our cases a considerable slough of this wound occurred from pressure of the traction apparatus. Nevertheless we are favorably impressed with this method and believe it worthy of a more extended trial.

We have also used an upper vertical and two lower horizontal pins in two consecutive cases. In both instances satisfactory lengthening was secured. In one, good alignment was maintained, while in the other, considerable displacement of the fragments occurred.

In patients with ankylosis of the hip we have lengthened the femur by means of the Hoke traction plaster with a horizontal pin through the lower fragment. A plaster of Paris spica is applied to the sound limb, bringing the plaster well down over the pelvis on the opposite side. The free end of a U-shaped stirrup of iron bar about six inches longer than the shortened leg is then incorporated in the plaster spica. To the lower end of this stirrup a rachet is attached. Traction is obtained through chains which are fastened at their upper ends to the pin, at their lower ends to the rachet. Countertraction is effected against the sole of the foot on the sound leg. It is surprising the facility with which lengthening occurs with this method. The alignment of the bone is more readily maintained because of fixation of the upper fragment.

In one case with a freely movable hip we employed the Hoke traction method with a vertical pin to maintain alignment of the upper fragment. Satisfactory lengthening was obtained with only a moderate displacement of the fragments.

From the foregoing paragraphs it will be seen that none of the methods developed for lengthening of the femur were satisfactory in every respect. In ankylosis of the hip joint, lengthening can be accomplished in the simplest and most effective manner by the Hoke plaster apparatus and skeletal traction. With a movable hip-joint transfixion of the upper fragment by horizontal or vertical pins seems necessary to maintain alignment. This alignment and contact of the bony fragments is of importance in the prevention of delayed union, and we find that the time required for consolidation of the callus is in direct ratio to the degree of their separation. The undesirable feature of transfixion of the upper fragment by horizontal or vertical pins is the danger of infection with subsequent drainage of the wound. Therefore the most scrupulous technique should be used in their insertion and in after-care of the wounds. It is possible that the danger of infection may be further minimized by the use of a fine wire in place of a steel pin, and it is our intention to try this method in the near future.

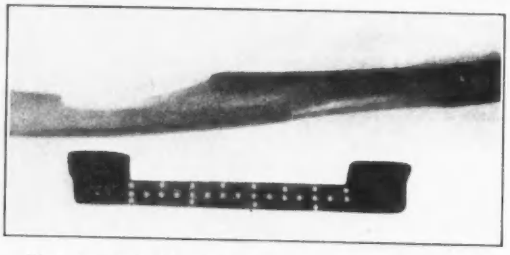

Fig. 4.—Lateral roentgenogram four months after lengthening of the femur in a case of infantile paralysis. A gain of two and one-half inches was secured.

POSTOPERATIVE LENGTHENING OF THE FEMUR

The postoperative lengthening of the femur is much the same as described for the tibia and fibula. In the former, however, we have found it feasible to begin traction on the fourth or fifth day after operation. Furthermore, we are able to lengthen this bone with greater rapidity and have gained as much as one-eighth of an inch per day in comparison with the average daily lengthening of one-sixteenth of an inch obtained in the tibia and fibula (Fig. 4).

After consolidation of the callus, ambulatory treatment is best carried out by supporting the limb in a plaster of Paris spica. The walking caliper splint is not sufficient for protection and does not prevent leverage action at the site of union. In two of our patients fractures occurred which were directly attributable to this leverage action.

RESULTS

The operation has been performed on seventy-three patients. In forty-eight the tibia and fibula were lengthened, while in twenty-five the lengthening was performed on the femur. The maximum gain in length of the tibia and fibula was three and one-fourth inches, the minimum one and one-half inches. In the femur the maximum gain was three and one-half inches, the minimum one inch. The gain of but one inch occurred in a child five years of age in whom union took place before the desired length could be obtained. In two patients gains from four to four and one-half inches have been secured by separate lengthening of the femur and tibia. The oldest patient operated upon was nineteen, the youngest eight.

The average time of union of the fragments in operative lengthening of the bones of the lower extremity sufficient to permit weight bearing with protective splints was from four to five months. In lengthening of the femur, where there was separation of the fragments, the time required for union was increased in direct proportion to the degree of their separation. In both tibia and femur lengthenings with good alignment of fragments, restoration of the medullary canal was observed in from ten to twelve months after operation.

COMMENT

To obtain the most satisfactory results with these procedures the surgeon must use discretion in the selection of his cases. He must be certain

that the shortening of the limb plays a major part in the production of the disability. In the presence of other contributing causes, as is so frequently seen in crippling conditions of childhood, the determination of the importance of the shortening as a source of disability must not rest alone on comparative measurements of the extremities. It has been our practice, therefore, to have the patients walk on boards of various heights so that we may detect any change in gait. The height of the board which produces the greatest improvement in gait may be used as an index for the length desired. A striking example of the importance of this preliminary examination of the patient's gait is seen in cases of anterior poliomyelitis with gluteus medius paralysis. Such a patient often walks better with a certain amount of shortening, and to lengthen the limb to the full amount, as disclosed by measurements, would often increase the disability. It should also be pointed out here that contributing causes of disability should be removed as far as possible before lengthening of the leg is to be considered. The notable exception to this rule is deformity of the foot which is often best corrected subsequent to lengthening of the bones.

Complications have occurred much less frequently in lengthening of the tibia and fibula than where the lengthening was done on the femur. In the former we have had two incomplete fractures through the callus subsequent to operation. In the latter we have had seven fractures through the callus occurring in cases with displacement of the fragments and in which inadequate protection was provided during early weight bearing. In instances of faulty alignment with massive callus formation the danger of fracture may be lessened by immobilization until consolidation has taken place, and by providing proper protection when the patient becomes ambulatory. In all of the fractures union has occurred with conservative methods of treatment, namely, complete rest and fixation of the limb.

We have had three cases of paralysis from injury to the nerves. In one operative lengthening of the tibia and fibula a paralysis of the dorsiflexors occurred immediately after operation. We attributed this to direct pressure of the upper pins against the anterior tibial nerve. That we were correct in our assumption was proven by the disappearance of the paralysis a few weeks after the pins were removed. In this patient we gained two inches of lengthening. In two cases of femur lengthening we had injury of the sciatic nerve with paralysis of the muscles which control the foot. In one of these the stretch on the sciatic nerve was produced by a faulty position of the limb following the operation. To maintain alignment of the fragments we fixed the extremity with right-angle flexion of the hip and complete extension of the knee, a position which placed the maximum tension on the sciatic nerve trunk. This resulted in paralysis of the foot muscles after we had secured one inch of length. Despite this paralysis we brought the hip into full extension and gained two inches in length. The second case of paralysis of the sciatic nerve was caused by subluxation of the knee, prominence of the head of the fibula and lengthening with the hip held in flexion. In the first patient the paralysis cleared up entirely in three months' time; in the second, a partial recovery had taken place at the time of the last observation, which was about four months after operation.

Infection of the wounds for exposure of the bones occurred in one case of operative lengthening of the tibia and fibula. A localized osteomyelitis developed which required drainage and sequestrectomy. Despite the infection a gain of two inches was obtained. In another patient, sepsis of the operative wound in lengthening of the femur was due to an infection of the operator's throat. Cultures from the wound and throat of the surgeon showed hemolitic streptococci. Thorough drainage of the soft parts was instituted, but no operation on the bone was necessary.

Infections of the pin wounds have not been a troublesome feature in the operative lengthening of the tibia and fibula. In the four-pin method the wounds have healed in an average time of three weeks. With the larger pins in femur lengthening, a period of four to six weeks is usually required for complete healing. In several cases where the upper pin was introduced through the femur by incision, infection with prolonged drainage has occurred. In some of these, healing was not secured until after removal of small ring-shaped sequestra. This again emphasizes the importance of avoiding incisions for insertion of the pins.

SUMMARY

1. In this article the writer has described methods which he has developed for the operative lengthening of the tibia and fibula and the femur. These methods have been used in seventy-three children. The oldest patient was nineteen, the youngest eight.

2. The method for lengthening of the tibia and fibula may now be regarded as an excellent procedure where marked shortening is a cause of serious disability.

3. A number of methods have been developed for lengthening of the femur. Our difficulty with all of them has been in maintaining alignment of the fragments. Failure to control the position of the fragments is the main cause of delayed union and postoperative fracture. In its present stage of development we regard the operation for lengthening of the tibia and fibula as safe and sound in the hands of those experienced in bone surgery and who, in addition, have familiarized themselves with every detail of operation and postoperative care. We are hopeful that with further experience a method for operative lengthening of the femur will be devised which will be as simple and effective as that employed for the operative lengthening of the tibia and fibula.

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DISCUSSION

GEORGE H. SANDERSON, M. D. (809 Medico-Dental Building, Stockton). — Operations to equalize the length of the lower extremities have been done for many years by various methods and with varying degrees of success. Rizzoli as early as 1847 equalized the lower extremities by shortening the normal leg, and this method has been more or less in use ever since.

Leg lengthening is far more constructive as it aims at the production of the natural length of the leg by operating on the affected side. It has the additional advantage of being no risk to the normal, or the more normal leg. However, bone shortening has its indications. It is much easier to do, is somewhat less risk, and the period of postoperative disability is considerably shorter. Where a person happened to be taller than desirable, and the legs unequal, the desired shortening would be accomplished. This is however, rarely the case, as almost all cripples are below the average stature, and would therefore much desire to be taller.

Sensing the desirability of the preference of lengthening, Codivilla in 1905 began lengthening the lower extremities in cases shortened following fractures, by means of osteotomy followed by skeletal traction. Many others then used this method. The results were not very satisfactory as the desired degree of lengthening was not obtained, and delayed union usually ensued.

In 1918, Putti reported the use of an instrument which produces both traction and countertraction directly upon the bone to be lengthened, as well as continuous elastic expansive traction, by means of an incorporated spring. This instrument embodies some of the principles which Doctor Abbott has developed in his method.

While Putti reported some excellent results, in spite of the inevitable delayed union, his apparatus was not successful in the hands of others, and leg lengthening became quite unpopular, most operators returning to the old shortening operations for equalization, or being content with shoe irons and other unsightly and clumsy mechanical contrivances to make walking possible on the two legs.

Up to the time of Doctor Abbott's work, bone lengthening had been done almost entirely on the femur, and practically all successful cases had been those where shortening had been due to fracture. Doctor Abbott set out to develop a method applicable to shortening due to infantile paralysis and other conditions in childhood which result in growth disturbances. This is a more difficult problem in that it deals with a condition where the desired length has never existed. He soon found that in infantile paralysis, shortening takes place to a greater extent in the tibia and fibula than in the femur, and made his apparatus applicable to the lengthening of these bones as well as to the lengthening of the femur. Furthermore, he developed the only method which maintains contact between and accurate alignment of the fragments. This was found to be more easily maintained in the lower segment of the leg, while the lengthening itself was found to be somewhat more difficult there. This method has also practically done away with the development of delayed union, which was the rule with previous procedures. Last year I had the good fortune to visit the Shriners' Hospital at St. Louis and see this wonderful work going on under the supervision of Doctor Abbott. I was truly amazed to find not less than eight patients there undergoing leg lengthening at the same time. It was most pleasing to see this very major complicated procedure being carried out there with no evidence of concern, in a matter of fact way as if it were practically a routine procedure. I am sure you will all feel after seeing his pictures, as I did, after visiting his clinic, that this development is really a great contribution to surgery.

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H. D. BARNARD, M. D. (2400 South Flower Street, Los Angeles).—The bone lengthening procedure, as worked out by Doctor Abbott, constitutes a distinct contribution. Our experience at the Orthopedic Hospital in Los Angeles dates back to May 1929, and in our total of eight cases, we have been decidedly conservative in selecting patients with proper regard as to the indications, and have been impressed with the results.

The procedure is undoubtedly a major undertaking and requires scrupulous attention to detail. The results obtained by the use of the four-pin apparatus indicate that the keeping of proper alignment is decidedly facilitated. In our series, one infection occurred which apparently in no way affected or compromised the end result, which was perfectly satisfactory. In these cases we obtained an average increase in length of approximately two and one-eighth inches. The procedure should not be attempted by surgeons not accustomed to the frequent surgical invasion of bone, nor in a hospital where the entire personnel is not familiar with the practical problems associated with the care of patients in apparatus of this type. We feel that great credit is due Doctor Abbott in placing this procedure on a practical basis.

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S. L. HAAS, M. D. (450 Sutter Street, San Francisco).—Bone lengthening has been placed on a sound practical basis by Doctor Abbott. One is prone to forget after performing this operation that it took some courage primarily to sever practically all the main hindering tissues of the leg and then subject the vessels and nerve to a stretching of one or more inches. Just how much would the vessels and nerve stand without permanent injury, the possibility of gangrene, infection, failure of union and the yielding of the soft osteoid callus to traction, were important problems that had to be solved. The success of the operation is sufficient proof that all these questions have been answered during the period of investigation.

At the Shriners' Hospital in San Francisco twenty-five tibial lengthenings have been performed. We have utilized the original Abbott apparatus with two pins, without the equalizer, in most cases. Although at times there has been some displacement of the fragments, the clinical results in all the patients have been satisfactory. Recently we have been using an apparatus designed by Moore of Chicago which is rather simple to manipulate and gives good results. We have subtituted movable side pieces with multiple holes instead of his fixed side plate. This does away with the necessity of sterilizing the apparatus and driving the pins in an exact line. With the movable plates the apparatus can be put on at the completion of the operation.

It is important, as Doctor Abbott pointed out in his original article, to inspect frequently the line of incision on the dorsum of the foot and to watch out for pressure necrosis of the skin. Do not try to hold the fragments down with external pressure over the crest because of the danger of skin necrosis. In one patient we had a wide separation of the skin after the stitches were removed, but the wound healed without any bone infection. We have had no cases of osteomyelitis.

It may be well to postpone the stabilizing operation until after the lengthening, but we usually perform the stabilization of the foot about the ninth year and

the lengthening two or more years later. We have not been bothered by the subsequent deformity of the foot, but there has been a tendency toward loss of motion in the ankle joint and increase of the equinus.

The selection of a suitable case for lengthening demands considerable judgment, as stated by Abbott. In the patients with weak hip muscles it is often difficult to decide whether the bad gait is caused by the weak glutei or by the shortening. Whenever it is necessary we have performed the Ober or Legg operation as a supplementary procedure.

Some surgeons advise against lengthening operations unless the shortening is at least two inches. It is well known that the pelvic tilt will take care of one and one-half inches of shortening, but a shortening of one inch in paralytics may cause more disturbance than two inches in a nonparalytic. Furthermore, it is often difficult to determine the amount of lengthening that is best for the individual. The alignment test and walking with a raise on the shoe is advisable, but I believe that lengthening up to the full amount of measured shortening is advisable because, as a rule, a further shortening takes place up to the time of full growth.

As most of our lengthenings have been done on patients already suffering from a rather severe degree of paralysis, one may experience more trouble should an attempt be made to lengthen a leg without primary nerve disturbance.

The observation on femoral lengthenings is limited to the results of eleven operations. The most troublesome complication has been the restriction of flexion of the knee joint after operation. This I believe is due to a fibrosis in the joint itself, secondary to reaction of the pin near the quadriceps pouch.

With the use of the Hoke traction apparatus, one could perform a lengthening of the femur quite satisfactorily. It may be advisable to place one pin in the upper end of the tibia for the first part of the lengthening and then, if necessary, utilize a pin in the femur for the completion of the operation.

TEMPORAL LOBE LESIONS: DISTURBANCES OF THE VISUAL PATHWAYS*

REPORT OF CASES

By HARRY A. CAVE, M. D.
San Diego

DISCUSSION *by Howard W. Fleming, M. D., San Francisco; Carl W. Rand, M. D., Los Angeles.*

THE object of this paper is to call attention once more to certain facts that will aid in the correct and early localization of intracranial neoplasms. Since the visual fibers, either primary or secondary, extend almost the entire length of the anteroposterior diameter of the cranial vault, it is evident that the interpretation of signs and symptoms resulting from their interruption by a disease process becomes vitally important and affords valuable information from a localizing standpoint. This is especially true in lesions of the temporal lobe.

LOCALIZATION OF INTRACRANIAL NEOPLASMS

The greatest problem in connection with intracranial neoplasms has been not so much the diagnosis itself as the localization of the lesion once the diagnosis is made. This is especially true in those cases in which the so-called silent areas of the brain are involved and it, therefore, behooves us as diagnosticians to call attention to and utilize every possible means at our disposal to make as early and as accurate a diagnosis as is possible.

In 1899, thirty-one years ago, Byron Bramwell,[1] in an article on the localization of brain tumors, made the statement that "tumors of the temporosphenoidal lobe, and more especially those of the right side, were of all tumors the most difficult to diagnose because they involved the most silent areas of the brain." Such a statement was the result of the lack of accurate anatomical knowledge of the structures involved in the temporal lobes, namely, the visual pathways.

The anatomical details of the visual tracts were accurately worked out and described by Niessel, Von Magendorf, Archambault, and other anatomists, but it was Adolf Meyer [2] who in 1907 first realized the clinical significance of these findings. He called attention to defects in the visual fields resulting from lesions affecting the optic radiations during their passage through the temporal lobes where they make a forward and ventral detour around the temporal horn of the lateral ventricle before reaching the calcarine fissure of the occipital cortex (Figs. 1 and 2).

The importance of these anatomical findings was still unrealized as late as 1911, when Foster Kennedy,[3] in a careful symptomatic analysis of nine cases of temporosphenoidal lobe tumors from the records of the National Hospital of Queens Square, London, failed to attach any significance to the value of defects in the visual fields, saying that "an examination of the pathological findings suggests the probability of a hemianopsia having been present during life. Five patients were examined perimetrically and the sole abnormality discovered was the concentric contraction of the visual fields, so often associated with severe and especially protracted papilloedema."

Cushing [4] in 1921, however, in a series of cases with careful perimetric studies, pointed out the early involvement of the visual pathways in temporal lobe tumors. Of thirty-nine cases in which perimetry was possible thirty-three showed homonymous field defects, indicating involvement of the temporal loop of the optic radiation. He also called attention to the partial or quadrantal field defects which may later develop into a complete homonymous hemianopsia as being an early characteristic finding of temporal lobe involvement and urged the use of careful perimetry in all cases where a tumor is suspected.

A further contribution was made in 1925 by Lillie,[5] who found that in one-third of a series of 168 cases of verified cerebral tumors the tumors occurred in the temporal lobe, and that forty-three out of fifty-one of these cases presented homonymous defects in the perimetric fields.

All four cases here presented had temporal lobe pathology and all of them showed characteristic visual field defects that were of localizing value. In three of the cases localization was possible by the perimetric field defects only, the neurologic

* Read before the General Medicine Section of the California Medical Association at the fifty-ninth annual session at Del Monte, April 28 to May 1, 1930.

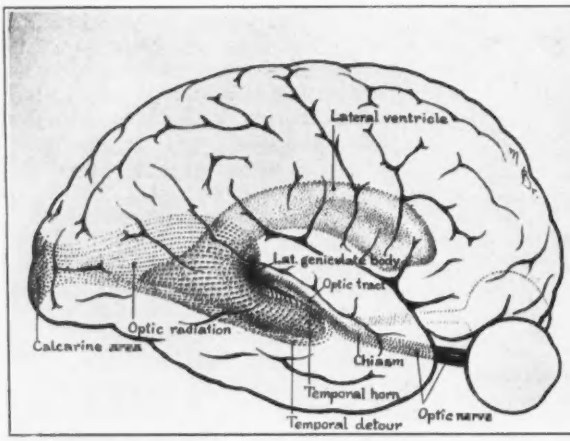

Fig. 1.—Geniculo-calcarine pathway from the outer side, showing the temporal detour of the optic radiation. From Cushing, Harvey: Distortions of Visual Fields in Cases of Brain Tumor, Trans. Am. Neuro. Assn., p. 378, 1921.

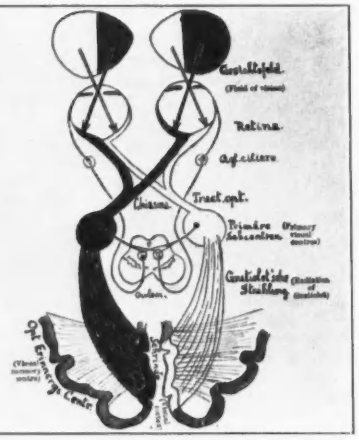

Fig. 2.—Visual tract and pupillary reflex tract. From Bing, Robert: Compendium of Regional Diagnosis in Affections of the Brain and Spinal Cord, p. 192.

findings being insufficient to make an accurate diagnosis. The fourth case had both field defects and positive neurologic findings.

REPORT OF CASES

Case 1.—A young man, a clerk, twenty-four years of age, was first seen in November 1928, complaining of headache, nausea and vomiting, diplopia, and difficulty in urination. The patient had been well until ten months previous to this time, when, following a drunken brawl at a roadhouse, he developed severe bifrontal headache with nausea and vomiting. He was taken to a hospital, where he remained for three weeks, during which time he was delirious, violent, unmanageable and disoriented; he was said to have had slight fever. Spinal puncture showed a blood-tinged fluid under increased pressure. At the same time he developed a right facial paralysis and blindness on the right side. His condition gradually improved and the patient went home, but he noticed a marked memory defect; he couldn't remember where goods were in the store or the prices of them, and he would start to make deliveries but would forget where he was going. Two weeks previous to examination his headaches returned, he became drowsy, stuporous and ataxic, and had difficulty in walking and in starting his urine.

Physical examination revealed an undernourished young adult, drowsy and stuporous, poorly oriented and ataxic, but thoroughly coöperative in everything which he was asked to do. Neurologic examination showed no disturbance of cutaneous or deep sensibility. Apart from a peripheral type of weakness of the right side of the face and a bilateral ptosis, there was no muscular weakness. The deep tendon reflexes were active and equal. Babinski's test was negative. He showed an ataxic gait and was incoördinate (+ 2) on finger-nose and heel-knee tests. Romberg test was positive. Pupils were small and inactive (— 4) to light. Convergence was poor (— 3), as were upward and downward movements of the eyes. Fundoscopic examination showed the disks to be hyperemic with blurring of the nasal margins and slight engorgement of the veins. The visual fields showed a complete right homonymous hemianopsia (Fig. 3). An examination of the spinal fluid showed an increase in the globulin content with a total protein content of 60 milligrams per 100 cubic centimeters of fluid, negative Kolmer reaction, twenty-one small lymphocytes and seventeen large lymphocytes per cubic millimeter of fluid with a zone II colloidal gold curve.

Comment.—The diagnosis of brain tumor seemed quite probable, but from the neurological findings alone its location was equally uncertain. The right homonymous hemianopsia, however, definitely placed the lesion on the left side of the brain behind the chiasma. Later the patient developed three generalized convulsions and died. Autopsy revealed a large, cystic degenerating glioma involving the floor and the lateral wall of the lateral ventricle and extending into the left temporal lobe. (The marked pleocytosis in the spinal fluid is a rather unusual finding in a neoplasm.)

* * *

Case 2.—The patient, a housewife, aged twenty-eight, was first seen in October 1928, complaining of headache, nausea and vomiting, with diminution in vision. The headaches, which began four years previously, were of a dull aching character, occurred in the left supraorbital region and recurred at irregular intervals, varying from a week to a month. They usually occurred in the morning, lasted all day and were associated with nausea and vomiting. There was a gradual diminution of hearing in the left ear, with recurring attacks of bilateral tinnitus. Two years later she had a "hard" attack of headache with nausea and vomiting which lasted continuously for five days and was associated with marked diminution of her vision. One year before examination she had a second similar "hard" attack, and a third one occurred two weeks previous to examination. The last attack awakened her in the morning with severe aching pain in the left supraorbital region which persisted continuously for twelve days and then disappeared spontaneously. A physician was called who punctured her left frontal sinus with partial relief, but repetition of this procedure had no effect on the pain. Diminution of vision started with the attack and persisted to the time of examination. Four days previous to examination she noticed a twitching and jerking of the muscles of the left side of her face and left arm for a period of about fifteen minutes.

General physical examination failed to reveal any significant findings. Roentgenograms of the head and chest were negative. Urinalysis was negative. Blood count showed: hemoglobin, 80 per cent; red blood cells, 5,140,000; and white blood cells, 11,900. Wassermann reaction of the blood serum was negative. Neurological examination showed no demonstrable

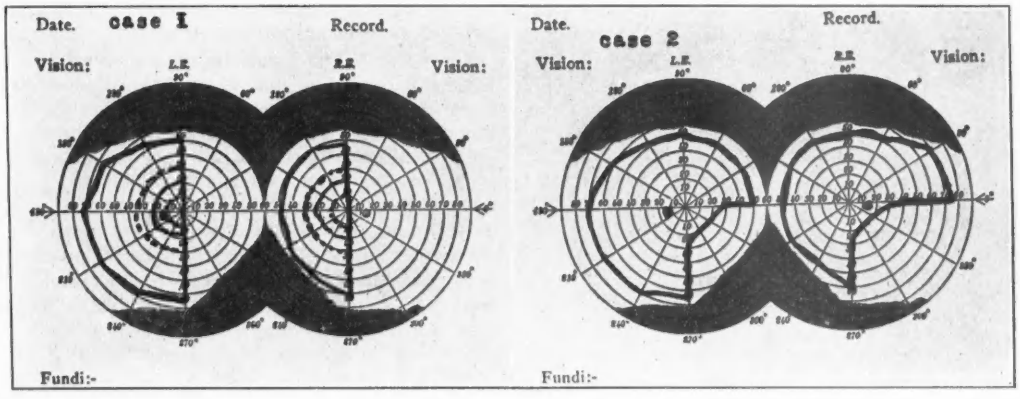

Fig. 3.—Visual field of patient reported in Case 1, showing complete right homonymous hemianopsia.

Fig. 4.—Visual field of patient reported in Case 2, showing inferior right quadrant homonymous hemianopsia.

muscular weakness or loss of cutaneous sensibility. The biceps and triceps reflexes were slightly more active on the left than on the right; patellar and Achilles reflexes were equal and active; Babinski reflex was negative. There was slight incoördination on finger-nose and heel-knee test bilaterally. Her gait was slightly ataxic and she had a tendency to lose her equilibrium while standing on one foot. Pupillary reflexes were normal. Ocular movements were good in all directions and there was no nystagmus. Fundoscopic examination showed bilateral acute choked disks, three diopters on the left and two diopters on the right with hemorrhages and exudates. Perimetric examination of the visual fields showed an inferior right quadrant homonymous hemianopsia (Fig. 4).

Comment.—The prolonged history of headache, nausea and vomiting, with a bilateral choking of the disks, presented the classical symptomatology of a brain tumor, but did not localize it. The history of a recent Jacksonian type of convulsion, involving the left side of the face and left arm, suggested a lesion in the right motor cortex. Neurological examination, however, did not show any demonstrable weakness of these muscles and there was not sufficient variation in the reflexes to be of any diagnostic value. The only finding of localizing value, therefore, was the right quadrantal hemianopsia which placed the lesion on the left side of the brain. Accordingly a diagnosis of left temporal lobe lesion was made. Exploration revealed a tense and bulging dura. A puncture needle was inserted and five cubic centimeters of a typical, yellow, gliomatous fluid was aspirated. The needle was reinserted in a backward direction and an ounce of darker fluid was obtained. After evacuation of the cyst the brain collapsed and there was no further evidence of tension on the dura. The operation was completed as a decompression. Following surgery, the patient improved temporarily, but when last heard from was rapidly failing.

* * *

Case 3.—This patient was first seen in October 1928, on account of headache, nausea and vomiting. The headaches started rather abruptly in May 1928, coming on in the early morning, occurring in the frontal regions and consisting of sharp shooting pains which radiated back over the right temporal area into the occiput and neck. The headaches were fairly constant in character, of moderate severity, and occurred almost daily. At the same time the patient noted periods of vertigo and on a few occasions she had fallen. In August 1928, nausea and vomiting began. Diplopia occurred about the same time and for three weeks before examination she was troubled with visual hallucinations in which she saw small animals such as squirrels, ducks, and cats on people's clothing as they approached her, as well as numerous colored (green, yellow, and blue) beads and flowers. During these three weeks there was also present incoördination and weakness of the muscles of the left hand and arm.

Physical examination revealed a poorly nourished woman of forty-five years of age who had a slight paresis of the whole left side of her body, including a weakness of the left side of her face. There were no disturbances of superficial or deep sensibility. There was a slight increase in the deep tendon reflexes on the left side with normal plantar reflex bilaterally. There was slight (grade I) incoördination in the left arm and leg, and her gait was ataxic.

Eye examination revealed large, evenly dilated pupils which did not react to light or accommodation. There was difficulty in moving the eyes upward and a marked bilateral nystagmus. Examination of the fundi showed a bilateral papilledema of four diopters with numerous linear hemorrhages and a complete left homonymous hemianopsia.

Comment.—Localization in this case was not so difficult as in the two previous ones. The left homonymous hemianopsia and the left motor weakness both pointed to a lesion of the right temporoparietal area. A decompression was done, exposing the dura over this region. The dura was not under any great degree of tension, but an exploring needle failed to reach the lateral ventricle. A definite resistance was encountered about three and one-half centimeters posterior to the rolandic area and about five centimeters below the surface of the cortex. Material removed for diagnosis proved to be choroid plexus. Operation was completed as a decompression.

The patient had a very stormy convalescence and died about five months later. Autopsy was not done.

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Case 4.—A retired watchmaker, forty-eight years of age, was first seen in November 1929 at the County Hospital, having been sent there from the Psycho-

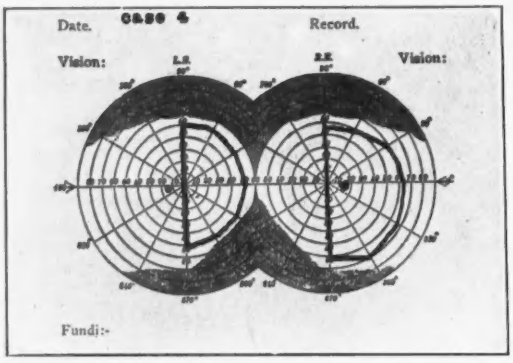

Fig. 5.—Visual field of patient reported in Case 4, showing complete left homonymous hemianopsia.

pathic Hospital to which he had gone on account of a definite personality change, associated with severe headaches and loss of vision.

Severe bifrontal headaches began rather suddenly in March 1929. These would come on at any time and usually lasted about twelve hours; for the past three weeks they had been associated with nausea and vomiting. For the past year the patient had been fatigued and tired out and would lie down and sleep for hours at a time. There occurred a definite character change and he became very self-centered, introspective, depressed, and gloomy. His vision had been poor for the past thirteen years and he was forced to give up his work as a watchmaker. Following a generalized convulsion nine years previously, the patient had occasionally noticed a revolving fan above his forehead. This hallucination was not present all the time, but had been much more prominent and persistent during the four weeks previous to examination. Ever since this convulsion he had been subject to falling spells which would come on suddenly at any time, without an aura, and were unaccompanied by any of the tonic, clonic or involuntary muscular movements common to epilepsy. On a few occasions he had noticed what seemed to be slight uncinate attacks.

Eleven years previously the patient had had a moderately severe case of pulmonary tuberculosis and spent two years in a sanatorium; the disease had then been pronounced arrested.

General physical examination revealed a thin undernourished adult male suffering severely from pain in the head but clearly oriented, of good mentality and perfectly coöperative. He had a moderate degree of dental and tonsillar sepsis; the chest showed some fibrotic changes in both apices characteristic of a tuberculous process of long standing. The heart findings were normal, and his blood pressure measured 114/78 millimeters of mercury. The blood count showed a slight secondary anemia with a 12,000 leukocyte count. Neurological examination showed no demonstrable muscular or sensory disturbances. The deep tendon reflexes in the upper extremities were slightly more active on the right than on the left. The knee and Achilles reflexes were hyperactive, plus three, bilaterally. There was a positive Oppenheim and Mendel-Bechterew reflex on the left and a positive Gordon reflex on the right. There was an incoördination on performing complicated movements with the right hand, but the left appeared normal. He presented a strongly positive Romberg and his gait was markedly ataxic. Eye examination showed the pupils to be slightly dilated, but they reacted promptly to light and accommodation. Ocular movements showed a paralysis of the left external rectus, but there was no nystagmus. Fundoscopic examination showed a bilateral acute choked disk of five to six diopters with numerous hemorrhages and exudates and a complete left homonymous hemianopsia (Fig. 5).

Comment.—The headache, nausea, and vomiting, with choked disk confirmed the diagnosis of brain tumor, but the reflex changes were variable and inadequate to localize the lesion. The convulsive seizure and the uncinate attacks both pointed to temporal lobe involvement, but the left homonymous field defect localized the pathology on the right side of the brain.

A right subtemporal decompression showed the dura under marked tension with bulging and flattening of the cerebral convolutions. An exploratory needle failed to enter the lateral ventricle, but encountered a firm resistance deep in the posterior portion of the temporal lobe. Considerable bleeding was encountered and the wound closed as a decompression. Deep x-ray therapy was given, but the patient later died.

Autopsy revealed a degenerating cystic glioma deep in the posterior part of the temporal lobe and coming to the surface on the tentorium cerebelli (Fig. 6).

GENERAL SYMPTOMATOLOGY

Uncinate Attacks.—Ever since the time of Hughlings Jackson's original description of these peculiar uncinate attacks and the convulsive seizures that bear his name they have been considered evidence of temporal lobe pathology; judging from Cushing's series and from the cases reported here, however, they are much less frequent than are field defects. However, when they do occur they are a very significant finding, pointing to involvement of the temporal lobes although in themselves they do not distinguish which lobe is affected.

Fig. 6.—Degenerating cystic glioma found at autopsy in posterior portion of left temporal lobe of patient reported in Case 4.

Visual Hallucinations. — Visual hallucinations are very interesting and complicated phenomena and are usually considered a part of some such mental aberration as is seen in dementia praecox; on the other hand, however, they may be associated with such definite pathology as a tumor. These visual pictures may be nothing more than spots or bright lights or they may assume very clearly defined and vivid pictures that are presented time and again to the patient. Good examples of the latter are those found in the last two cases here presented. One patient (Case 3) saw little animals, flowers, and gayly colored beads, while the other (Case 4) saw very distinctly a fan revolving above his forehead off and on for a period of nine years previous to his present illness. He also had some type of uncinate attack, but these were poorly described and of an indefinite nature.

Inasmuch as the occipital cortex is regarded as the seat of our visual impressions, one would expect that such clear-cut and distinct pictures would point to occipital lobe involvement. This, however, is not necessarily true, as shown by the two cases here reported and by the fact that thirteen out of Cushing's series of fifty-nine cases of temporal lobe tumors presented visual hallucinations of a clearly defined nature. It is probable that any irritation of the visual fibers is transferred to the occipital lobe where it is interpreted or registered as a definite picture in much the same manner that a man will experience subjective sensations in his toes long after his leg has been amputated.

Convulsive Seizures. — Generalized convulsive seizures occurred in the patient reported in Case 1 just prior to his death. The slight Jacksonian convulsion in the second patient (Case 2), involving the left arm and face, remains unexplained and only served to confuse the diagnosis further. In Case 4 the patient had had one generalized epileptic type of seizure nine years previous to examination and this was followed by recurring falling spells in which he did not lose consciousness or have any muscular spasms. In general, convulsive seizures played a very small part in furthering the diagnosis of any of these cases.

CONCLUSIONS

1. The histories and physical findings in four cases of temporal lobe tumors have been studied and reported.

2. Localization of the lesion was possible in three cases by the field defects alone, neurological examination being inadequate. In the fourth case the tumor was sufficiently large to involve both temporal and parietal lobes, thus producing both field defects and positive neurological findings.

3. Clear-cut and vivid hallucinations do occur in temporal lobe pathology, as shown by two cases in this series.

4. Convulsive seizures, uncinate attacks and petit mal attacks, long regarded as characteristic symptoms of temporal lobe pathology, were infrequent or absent.

Rees-Stealy Clinic.

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DISCUSSION

Howard W. Fleming, M. D. (384 Post Street, San Francisco).—Doctor Cave's paper emphasizes a most important and often neglected diagnostic procedure. Perimetry is time-consuming, but does not need elaborate apparatus or special training. Simple methods will reveal all gross field defects and, occasionally, such defects are the only signs of localizing value. The case reports given by Doctor Cave illustrate the value of perimetry in temporal lobe tumors. Gross lesions involving the visual tracts in the parietal and occipital lobes often give visual field signs of equal value, although they are substantiated more frequently by other symptoms and signs. Normal fields, in a patient with definite signs of increased intracranial pressure, are of great value from a negative standpoint, for the absence of defects in the fields of vision may localize a cerebral lesion to the frontal lobe or differentiate between pathologic change in the cerebrum and that in the cerebellum.

There are gross lesions of the brain, and particularly of the temporal lobe, other than tumors, in which perimetry may be very helpful. I refer especially to abscess and subcortical hemorrhage. The differential diagnosis between abscess of the temporal lobe and cerebral abscess is not always easy. If the patient is at all able to coöperate, repeated testing of the fields of vision may aid in an early localization of the pathologic changes. The enlargement of an abscess or tumor frequently can be estimated by the changes in the visual fields. Decrease in visual field defects is a valuable prognostic aid in cerebral abscess.

The case reports given in this paper illustrate the chronicity occasionally seen in brain tumors. The second patient gave a history of symptoms dating back at least four years. The patient cited in Case 4 very probably had been having symptoms referable to his tumor for at least thirteen years. These patients if seen soon after the onset of symptoms no doubt would have been diagnosed as cases of idiopathic epilepsy.

The medical profession is quite familiar with the classical signs of chronic intracranial pressure, *i. e.*, choked disc, nausea, vomiting, and headache. However, as our diagnostic ability improves, it will be just as reprehensible to delay diagnosis until the onset of this syndrome as it is at the present time to await abscess and peritonitis before diagnosing acute appendicitis. More and more tumors are being diagnosed and localized before marked intracranial pressure supervenes. Unexplained convulsions warrant the most thorough investigation, including encephalography or pneumoventriculography.

The fatal outcome of the four cases reported in this paper would seem to confirm a common impression regarding brain tumors. Though it is true that, as a group, gliomas do not offer so good a prognosis as do endotheliomas, they are not the entirely hopeless lesions they formerly were believed to be. Recent work by Cushing, Bailey, Penfield, and others, has emphasized that gliomas range from the most malignant to the benign. It is no longer sufficient to tap a cyst

and be content with a decompression. Particularly in the slow-growing tumors, removal of the mural tumor mass will effect a remission of many years, if not a permanent cure.

Doctor Cave has presented a most interesting and opportune reminder of the symptoms and signs of temporal lobe lesions. A visualization of the optic tracts and the use of perimetry in obscure head cases will assist materially in an early and correct diagnosis.

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Carl W. Rand, M. D. (534 Pacific Mutual Building, Los Angeles).—The importance of routine perimetric studies in all cases of suspected brain tumor is to be emphasized. Negative, as well as positive, findings are of value. In temporal lobe lesions a notching of the homonymous color fields is found much earlier than a constriction in the form field proper. Often it is not only the earliest, but the only localizing sign we have, especially if the lesion is in the right temporal lobe. Frequent perimetric studies will often indicate the increasing size of the lesion until a complete homonymous hemianopsia may be reached. Usually signs of pyramidal tract involvement appear relatively early which, together with uncinate gyrus attacks, sometimes clinch the diagnosis. I have been impressed with the character of visual hallucinations found in several patients with temporal lobe tumors. These were very vivid, always in the blind field, and so discrete that the patient would point to them and describe them. One described a yellow canary bird, a second a blue cup and saucer, and a third blue and red barnacles on the bottom of a ship. Occipital lobe hallucinations, on the contrary, are usually more bizarre. They may take color or light forms in the blind field, but seldom assume the figures of animals, people, or other objects. In temporal lobe hallucinations the object may or may not be in motion. I believe these hallucinatory objects are almost always something with which the patient has been familiar in his past experience. Careful leading questions may be necessary to bring out a history of visual hallucinations, as they may be infrequent and fleeting early in the disease, and the patient may not place any importance on them unless his attention is directed to them.

SOME PROBLEMS IN MEDICAL ECONOMICS*

By Carl R. Howson, M. D.
Los Angeles

It is a wise custom which prompts us at the close of the year to take stock of our accomplishments during the preceding twelve months, to see how far we have advanced and to look at what lies ahead of us.

During the past year your Board of Councilors has held one informal meeting, two special meetings, and eleven regular meetings for the transaction of business. With the increase in association members in recent years there has come augmentation of work, and on more than one occasion the sessions have continued until close to midnight. Much of a constructive nature has been accomplished. I desire especially to mention the work of your committees, whose reports you have heard tonight. Without their generous and efficient aid it would be quite impossible for your board to accomplish its aims. To the Board of Trustees, the Board of Councilors, and the various committees, the thanks of the Association are due for their untiring efforts on behalf of the common weal.

I desire at this time to express my appreciation of the constructive work and coöperation of my fellow officers, and also of the opportunity which has been afforded me of serving you during the past year.

In the main the work has been pleasant, and I shall long cherish the memory of the most enjoyable associations which have fallen to my lot in the Council and elsewhere. It is a source of great satisfaction to give place to a successor of such high ability and standing, and having such unanimous support, as Doctor Molony, for whom I prophesy the greatest year in the history of the Association.

For an organization of this type to function to its full efficiency it is necessary that it be permeated by a spirit of fraternalism, of service to the common cause, of willingness to work and to sacrifice, if necessary, for our best interests, realizing that so long as we preserve our ideals our best interests will be indissolubly tied up with the interests of the commonwealth. To this end all our activities should be coördinated.

The changing conditions of the past few years have made desirable certain changes in our by-laws, particularly in those sections relating to initiation fees, to the telephone exchange, to the terms of office of councilors, and to the regulations governing the election of officers.

One year ago certain amendments to the by-laws were submitted to the membership, but in spite of urgent appeals, lack of interest on the part of the members was such that it was not possible to secure the necessary two-thirds majority vote. It is hoped that during the coming year a more complete revision will be undertaken, and, if and when the amendments are submitted to you, I bespeak your interest and prompt vote.

If we are to profit by our opportunities, we must, as individual members of the Association, take sufficient interest to be informed regarding its activities and aims. It is the duty of the officers and councilors to supply as much information to the membership as is practicable. The Bulletin is the medium through which this must come, and, under the able editorship of our secretary, its columns this year have reflected to an increasing degree the appreciation on the part of your officers and boards of their responsibility and opportunity in this respect.

MEDICAL ECONOMICS

In 1924 the secretary of the American Medical Association stated that "the one great outstanding problem before the medical profession today is that involved in the delivery of adequate scientific medical service to all the people, rich and poor, at a cost which can be reasonably met by them in their respective stations in life." How much more is this true today? And to this I would add a second problem—the restoration in the minds of the public of the confidence and respect which were ours a generation ago.

It is stated on the basis of such very superficial surveys as have been made that not over half the population in Southern California patro-

* Address of the retiring president read before the Los Angeles County Medical Association on December 17, 1931.

nize the regular medical profession. This is indeed a lamentable reflection upon both the public and our profession, and particularly the latter, for on examination of the situation we find many factors for which we cannot avoid responsibility.

It is an axiom in the business world that if the public does not properly appreciate the value of a given article or line of merchandise, the public must be educated. The manufacturer does not spend his time berating them for their ignorance, or denouncing his competitors and their products. He realizes that if he is to succeed in the face of the keen competition of today he must do certain things. He must maintain the high quality of his product by using the best materials, and by constant research keep improving it, so that with changing conditions and the introduction of other similar products by his competitors he will still be in the lead. He must then inform the public concerning his stock in trade and its superior qualities, which he does by publicity. He must also supply his wares at a price which is reasonable and he must convince the prospective buyer that it *is* reasonable.

Let us consider how, as producers and purveyors of scientific medical service, we measure up to these requirements.

The many research organizations throughout the civilized world evidence the constant effort to increase our knowledge and render more efficient our fight against disease. The steady stream of reports of laboratory and clinical observations which emanate from our hospitals and clinics shows that progress is not limited to any group. In this respect, therefore, we may fairly claim to be keeping up with the times.

When it comes to delivering the product, however, another factor enters, in a manner and to a degree that the ordinary manufacturer does not have to deal with, *i. e.*, the human element; for our product, much public opinion to the contrary notwithstanding, cannot be delivered as it comes from the laboratory or hospital. It has to go through the hopper of the mind of the individual practitioner, and in many cases the child of science reborn after this experience would quite fail of identification by its own father. It must then be further adapted to the individual patient, and herein lies the *art* of medicine.

LEGITIMATE PUBLICITY IMPORTANT

So far as publicity for our wares is concerned, we must confess to an almost total failure to keep pace with the improvements in the product we have to offer. Scientific medicine has made wondrous progress during the past generation. It has made possible the building of the Panama Canal; it has ridden the tropics of many of their greatest scourges; it has almost rendered extinct that dread pestilence of our fathers and grandfathers, typhoid fever; it has played its part in the reduction of tuberculosis to a mere fraction of what it was within the life span of many of us here, and has made it possible to save many of its victims who formerly would have been doomed, but who under modern treatment are able to live useful and comfortable lives, and in a very high percentage of cases are completely restored to health. It has brought new life and hope to the diabetic, to the millions of sufferers from hookworm, to the luetic, and many others; it has pried open many doors and given us access to the mysterious forces that work in the production of rickets, pellagra, beriberi, tetany, and scurvy, and at the same time made possible both prevention and cure. It has given us new means of diagnosis and treatment—instruments such as the bronchoscope and the electrocardiograph, methods such as the determination of basal metabolism and all the refinements of chemical analysis of the body fluids. Many other wonderful things might be mentioned, most of them having dramatic possibilities equal to the wildest fancies of any fiction writer.

The quacks and cultists have spent millions of dollars telling the public of their unscientific so-called discoveries, while the medical profession has stood aside and aloof, with the inevitable result that the public, uninformed or misinformed, has passed us by. We have retreated behind our code of ethics as an excuse, when as a matter of fact it was our own conservatism, lack of foresight and indifference which we were trying to gloss over. At the eleventh hour we are awakening to the serious results of our lethargy, but the awakening, as is usual following deep sleep, is difficult and somewhat disagreeable. Meanwhile the public waits expectantly, beginning dimly to sense the overwhelming heart and life interest connected with our work, which they accuse us, not without justice, of having kept locked within our bosoms while the world hungered and thirsted.

Our Association has this year created a Committee on Publicity. You have heard their report tonight. For nearly six months now we have been broadcasting health talks for fifteen minutes each week over two of the largest radio stations in the city. Many of the articles broadcast have been prepared by our own members, most of them by the Publicity Committee itself. The material supplied by the American Medical Association has been of great assistance. The preparation and editing of these articles has involved more labor than is readily appreciated by one who is not conversant with the work. Within the past few days there has appeared in the Sunday edition of one of our leading dailies the first of a series of articles sponsored by this Association.

For the consummation of the arrangements with the radio stations, for the compilation and preparation of the articles, for the careful editing of the same and the arrangement of the programs, and for the preparation of similar matter for newspaper publication, this committee merits our sincere thanks. To the members who have prepared articles for use by the committee the thanks of the Association are also due. All this has been accomplished without expense to the Association. As evidence of its success, we have recently been approached by two other large radio stations with requests for similar articles which they might use, and the committee is endeavoring to tie in one of these with publicity matter for our State Association.

Such work, so well begun, must be continued and extended in its scope. It will bring returns more than commensurate with the effort and any expense which may be involved.

THE HIGH COST OF ILLNESS

For a number of years the hue and cry about the high cost of medical care has been increasing. Articles appear with growing frequency in lay periodicals with a general tone anything but complimentary to the medical profession. I should like to quote briefly: "In spite of the natural predisposition to confidence in the doctor, and in spite of the general recognition of the altogether miraculous advances in modern skill and knowledge, there is obvious everywhere a growing sense of irritation on the part of the public generally toward present medical practice" (*Harper's Magazine,* November 1930). This from the president of the Academy of Medicine of Northern New Jersey: "Most laymen feel that their own physician is a most trustworthy individual, but, while this is undoubtedly true, my reaction after twenty-five years of practice is that they also feel that all other physicians, and the profession as a whole, bear watching, and that their acts are influenced mostly by selfish motives" (*J. M. Soc., New Jersey,* May 1930). "Medical science is kept constantly up to date, but the organization by which it is applied is way behind the times. . . . I am convinced that medical science travels by airplane in an age of aviation, while medical organization lumbers along in a stage coach. Medical costs cause unrest. . . . I do not think I exaggerate when I say that the high cost of sickness, at least among the middle classes, is as potent a cause of social unrest as poverty among the poor" (E. A. Filene, *Journal of the American Medical Association,* October 19, 1929). A recent writer says: "More extensive medical care we must have. It will be voluntary and coöperative in its organization or it will be bureaucratic. Pure individualism has had its day.

In response to the agitation, Dr. Ray Lyman Wilbur, shortly after his appointment to his present office in the government, called a meeting, the result of which was the creation of the Committee on the Cost of Medical Care, with a five-year program of investigation of all aspects of the subject. This investigation is now at the end of its fourth year. Their studies early showed what other studies had evidenced, that the cost of medical care is but a small part of the cost of illness, between 23 and 30 per cent in fact. Realizing the incalculable harm which was accruing to the medical profession through the subtle propaganda contained in the name of this committee, attempts were made to have it changed to the Committee on the Cost of Illness or some similar title. After about two years' discussion, the committee one year ago met and considered the title, but the only change made was to "Costs" instead of "Cost"! This past year the writer was instrumental in having a resolution on the subject adopted by the Council of the California Medical Association, which was presented to the American Medical Association by our delegates, but in view of the time which had elapsed since the formation of the committee, no action was taken.

In spite of the drawback of its name, the reports of this committee will undoubtedly prove of inestimable value to the profession.

Analysis of data collected by this committee, and in other investigations, shows that the average cost of illness per family in this country is between $70 and $80 per year. Add to this the fact that, while 23 per cent of our national income is spent on pleasures and luxuries, only 3 per cent is expended for illness, and it is at once evident that, statistically at least, our people are not badly off in this respect. (They spend three times as much for tobacco and twice as much for candy as they do for physicians' services.) We must not, however, let the present-day reverence for the law of averages cause us to overlook the essence of the problem, for on further examination we find that it is the unequal distribution of these costs which hurts. About half the expense has to be borne by less than one-fifth the people, and of this half, approximately two-thirds falls on five per cent of the people.

This frequently results in a crushing debt, under which the family struggles for years. In a study of the relations of illness and dependency this statement is made: "Serious illness of either a breadwinner or of the homemaker lowers the family standards of living. This often means moving into a poorer neighborhood, living in a less desirable house with fewer rooms, less light and open space, disposing of some of the better or more salable articles of furniture, and curtailing recreation and variety and supply of food. These are circumstances and conditions which entail danger to physical health, and, even more, tend to break the morale of the family and increase overwhelmingly the sense of failure and inferiority characteristic of dependency." Uncertainty regarding the cost of illness is a great cause of complaint on the part of those whose incomes are in the brackets above $6000—a very small group numerically, but a very influential one.

We are justly proud of the provision which has been made for the care of the indigent sick. The most modern hospital accommodations and all the resources of scientific medicine are at their service. Can we wonder if the taxpayer, surveying the situation, finds that he is supporting for the nontaxpaying element much better accommodations and service than nine-tenths of his own class can afford when sickness comes into their homes? The fact that this is made possible by the doctors' donation of their services is of no consequence in his thought. Can we blame him for thinking that on the average a taxpayer must be of more value to society than one who has not the ability or character to be self-sustaining, and that, if the state or municipality is going to provide for its citizens, its first responsibility is to those who support it?

ATTEMPTS AT SOLUTION

For various reasons the problem has received attention from political powers in Europe in years past, and at the present time twenty-three coun-

tries have compulsory health insurance, and some fifteen have voluntary systems.

Germany.—The German krankenkassen system was inaugurated in 1883, and at present 32 per cent of the entire population is receiving care under its terms. Under this administration the status of physicians in Germany has steadily declined. Eighty per cent of them are now dependent upon insurance practice. Much of the doctor's time is taken up by paper work, and the medical service is stated to be superficial and unsatisfactory. There has been a great increase in the number of irregular practitioners, which is claimed to be due to the unsatisfactory service rendered by the krankenkassen doctors. The doctors who are most popular and have the largest panels are those who are most generous with disability certificates. The drain on the funds became so severe that in 1926 the supervising commission summoned 1,259,016 unemployed patients for a control examination. Approximately 200,000 did not appear but reported that they have recovered, a similar number appeared and reported that they could go to work again, and nearly 300,000 were examined and found able to resume work. Thus over 700,000 patients, or 56.5 per cent, were found to be able to take up their work at once.

England.—England's system was inaugurated in 1911 in face of the opposition of practically the entire medical profession. At first its administration was very unsatisfactory to the profession, but, little by little, changes have been brought about, until today, while far from being perfect, it is considered fairly satisfactory, and they have expressed themselves as in favor of its extension to the families of the employed. At the present time the doctor receives about $2.15 per year per person on his panel, and his average fee per visit (office and home, which have been found to be in the proportion of two and one-half to one) is about 50 cents. One must, however, bear in mind the status of the profession prior to 1911. Much of the private practitioner's work then was of the lodge and club variety, and the fees received ranged from 60 cents to $1.20 per year per person. About 35 per cent of the population comes under the operation of the National Insurance Act. No provision is made for consultations, specialists, or hospital care. Judged by our standards, the service would probably not be considered satisfactory. One man is reported as having seen eighty patients in his office in three hours. A friend of mine tells of having an appointment with a doctor for a certain hour. On reaching his office he found fifteen patients waiting in the reception room, so suggested that he return at a later hour, but was assured that it would not be necessary, for the doctor was usually able to see that many patients in fifteen minutes. Here, as in Germany, there is a great tendency on the part of the patients to claim disability when they do not wish to work at the job which is available, or at any job, with consequent pressure on the doctor to issue disability certificates for very minor ills, "anorexia" being a not uncommon stated cause. This has reached such an extent as to seriously endanger the entire scheme, and steps are now being taken for closer supervision of the most serious offenders in the professional ranks. Treatment of trifling illnesses has greatly increased the work of the doctors.

HOSPITAL COSTS

Many experiments are being tried in various parts of the country to meet the problem of hospital costs. Time does not permit full discussion of the situation, but mention may be made of the experiment in the Baker Memorial Hospital, part of the Massachusetts General, which is the most striking. Others which have attracted attention are the Bassett Hospital Guild at Cooperstown, N. Y., the Keokuk, Ill., plan, etc.

There is no question that many patients demand much more expensive accommodations than are in keeping with their income or scale of living. Much can be done by the doctors to educate their patients as to the sufficiency of the cheaper accommodations in the average case. Provision by the hospitals of more semi-private rooms and small wards will be necessary before it can be done on any large scale. To insure its wider acceptance also, the hospitals must be prepared to supervise more closely the patients admitted to the wards. Those who are so seriously ill that they disturb the other patients and interfere with their rest must not be allowed in the wards. Many such patients can afford the additional expense of a private room for the few days of acute illness following a major operation, being transferred to the ward as soon as their condition will permit. In other cases the hospital could probably afford to make an exceptionally low rate for the sake of preserving the atmosphere and popularity of the wards.

It is legitimate that the state bear the expense of educating the members of such an essential profession as nursing, and also relieve the hospitals from taxation.

We may hope that in time development of public spirit on the part of our wealthy citizens will result in more substantial endowments for our hospitals that will absorb the expense of free and part-pay care, now distributed among those paying full rates.

NURSING SERVICE

The development of group nursing offers a means of reducing costs. The system recently inaugurated by one of our local hospitals of employing special nurses on salary seems to be a step forward. By assuring the nurse of regular employment, with proper provision for recreation and recuperation after unusually difficult cases, a considerable saving to the patient should be possible. The development of visiting nursing should be encouraged by the profession of every community. We hope to see this in Los Angeles very soon.

HIGH COST OF MEDICAL CARE

Various attempts at a solution of high medical costs for the middle class have been tried in this country. We have had lodge practice with all its vicious elements. The railroads have been supplying care to their employees for many years, and on the whole very successfully. Other large corporations have undertaken it. One of the best

examples of reasonably good service at low cost is the plan of the Endicott-Johnson Shoe Company, which takes care of its fifteen thousand employees and their families at a very low annual cost. (It may be noted in passing that this cost is very considerably in excess of that under which the three largest local groups referred to in the next paragraph operate.) Many large corporations have taken out group insurance with standard old-line companies, under the terms of which the employees are provided with medical and hospital care, a small death benefit, and in some cases disability benefit. The insurance company then contracts with physicians to supply the care at a stipulated fee, according to the work done, or at a flat rate per year. The General Motors Corporation with its 150,000 employees, the Chrysler Corporation, and a few of our own large corporations are handling the situation in this manner.

CLINICS

In Los Angeles we have recently seen the development of group clinics which are taking care of large aggregations, the members of which pay into a fund a stated sum per month. From this fund the doctors are paid. Collections may be made from the prospective patients by the doctor directly, or there may be an intermediate organization. In the latter case the doctors may be paid a flat rate per month or for the actual work performed in accordance with a fee schedule.

Quite recently we have seen the extension of the group plan to individuals, the publicity being obtained through a working arrangement with one of the newspapers.

Part-pay clinics have been sponsored by hospitals and philanthropic organizations. In too many of these and other similar private clinics and dispensaries the work is still expected to be performed by the physician without remuneration. With the increasing complexity of medical practice, there is everywhere manifest an increasing tendency to lower the bars and admit to these clinics patients with incomes considerably in excess of those formerly classed as indigents. It requires no great effort of the imagination to conceive of the development of clinics, supported by philanthropic individuals or organizations, and ministering to the middle or upper middle classes, with insistence that the doctors provide the service without remuneration. It would perhaps be only natural for the donors to such organizations to feel that the least the organization could do for them would be to relieve them of responsibility for the medical care of their domestic employees. From a humanitarian standpoint we cannot fail to sympathize with the suffering, both physical and economic, of the former class, but we could scarcely be expected to support by our time and effort any plan which would not consider the doctor as worthy of his hire so far as this class is concerned, and most assuredly in regard to the second-mentioned class. We can conceive of no such demand being made upon the members of any other profession. In the conduct of all these clinic arrangements, should not the doctors, who, to quote the words of a recent speaker in our midst, make up the warp and woof of the scheme, have a determining voice in regard to the conditions under which they shall render such services, and to whom?

FEE SCHEDULE

Recent moves in the direction of the application of the Industrial Accident fee schedule to the practice of medicine, as distinct from surgery, also merit our attention. Certainly it was never the intention of the profession that this schedule should be extended to include such work.

The great bulk of industrial accident work consists of minor surgical treatments. The determination of the status and progress of such conditions is usually simply a matter of observation of the lesion, the change of dressing being done by the nurse or other assistant. It is not so with medical conditions, for the patient must be questioned, and frequently a partial physical examination made, and the time so consumed must be measured in multiples of the time of the minor surgical attention.

Not even the most enthusiastic industrial surgeon will claim there is any profit to the physician in house calls for the fees allowed in this schedule. Obviously he will make such only in the hope of being able to secure work of the more lucrative type. As such visits make up a very appreciable part of the work of the general practitioner, the deficit must be made up, to a great extent at least, by surgery. Under the most favorable conditions the medical practitioner is confronted with many temptations to step aside from the narrow path of rectitude and honesty, and the urge to unnecessary surgery under such conditions must inevitably be so strong that the organized profession cannot ignore the situation thus developed.

FINANCIAL ARRANGEMENTS

In all the chaos and confusion one point stands out—provision must be made which will enable the individual and the family to budget expenses for sickness. At present the person who saves in advance for illness is so rare as to be almost a curiosity. Thanks to the high pressure salesmanship and instalment-selling of modern industry, the income of the average individual has been budgeted for him far into the future, and budgeted so thoroughly and completely that there is rarely any money left for unexpected expenses. We cannot tell the people how they shall spend their money, and some means must be provided whereby they can make provision for sickness on a basis of weekly or monthly payments. It is further necessary that such payments be made into a central fund, and that such fund be contributed to by a large group, so that the costs may be averaged and thus not fall with undue weight on any individual. For this reason insurance policies which pay a stated sum cannot be considered as affording other than a partial solution of the difficulty. To a certain extent the same criticism applies to some of the arrangements which have been made with group clinics, because of the limitations placed upon the type of diseases treated and the extent of hospital care.

The advisability of the medical profession handling this fund is open to serious question. It

would be in the nature of a highly speculative investment on the part of a scientific organization. Even the insurance companies, with their highly paid actuaries, find themselves on shifting sands when dealing with this type of business. The safer plan would seem to be to have the group of employees or individuals who are making such arrangements form their own organization for collecting and dispensing the money, and make their own contracts with the hospitals, so that the doctors will be responsible only for the medical care.

It is essential that, in the establishment of any such arrangement, the building up of a reserve fund receive first consideration; otherwise the first unforeseen epidemic will probably bankrupt the fund and perhaps wreck the whole plan.

While we can see no objection to the principle that an individual should make monthly payments into a fund to cover the costs of illness, it is a question just where we should draw the line in regard to limits of incomes below which limit the individual shall be eligible for treatment under group schedules, and above which we should insist on his coming to us as a private patient.

THE METROPOLITAN WATER DISTRICT ARRANGEMENT

During the past year we have made an arrangement with the Metropolitan Water District, the terms of which are no doubt familiar to all of you. The group of employees covered are stated to have an average monthly income of $175 or a little less. The money is collected by the district from its employees, and the doctor is paid in accordance with a fee schedule agreed upon. The essence of the contract is that no doctor shall be required to do this work unless he so desires, and that the patient shall have entire freedom of choice of his physician from among the members of the Association.

This arrangement is not to be thought of as a cut-rate plan. The fees set forth in the schedule were considered by the committee to be reasonable fees for ordinary attendance upon individuals with incomes such as these average. Special services, complicated and difficult surgical procedures, etc., entitle the physician to special fees.

The 33 1/3 per cent reduction in fees to the patient is one which is made possible by organization and the elimination of uncollectible and slow-pay accounts. The doctors' net receipts are unchanged, and in fact they are probably increased, because there can be no doubt that the patients will have less hesitancy about calling the physician under this arrangement, and that many cases will come to him which would otherwise have to be taken care of at the County Hospital or would have gone to the irregulars.

Our arrangement has attracted wide attention, and is being watched by medical and other interests all over the country. I believe it is a constructive step toward a solution of one phase of the problem.

ADEQUATE CARE

In all our studies we are handicapped by lack of knowledge of what is considered adequate medical care, and what such care will cost. I believe that only experience will enable us to answer this. We are still undecided whether adequate medical care is what we shall consider as approaching the ideal, whether care equal in quality to that which any given groups are accustomed to receive is to be considered adequate, or if not, to what extent the standard should be raised above that of the accustomed quality. The New York Medical Guild, which was inaugurated by the doctors themselves, has several interesting features. Among others is the provision of a full medical service plan for $52 per year, and a de luxe service with private hospital room and special nursing, for $208 per year.

INDIVIDUAL AND GROUP PRACTICE

Much has been said about the necessity for the preservation of the personal relationship between doctor and patient, which is especially difficult in the workings of a large group of physicians. There can be no doubt that this is very essential for some patients, but candor compels us to recognize the fact that there are many people who are not concerned about this phase of medical services, and are quite satisfied to receive attention from any member of a group in which they have confidence.

The people have been educated to expect a higher quality of service from a clinic or group than they receive on an average from the individual physician. We have brought them to this state of mind, and cannot dodge the responsibility for seeing that our clinics do stand for a high standard of medical service.

Individualistic medicine cannot but be wasteful to some extent, and the trend is definitely toward group work.

INSURANCE COMPANIES

We must also note in passing that the entrance of insurance companies into the field cannot be viewed by the profession with equanimity, for it means that the tendency will be to concentrate the work in the hands of a few physicians. As the insurance company can remain in business only by making a profit, its interest lies in keeping the fees paid the doctor as low as possible. I am informed that in computing premiums on this class of work the insurance companies figure their overhead and profits as consuming 45 to 50 per cent, leaving about 50 per cent of the funds paid by the policyholders available for compensation to the doctors, hospitals, etc. Furthermore, as an insurance man recently stated, the doctor must realize that he will be working, not for his patient or for himself, but for the insurance company.

POLITICAL ACTION

The imminence of political action looking to state medicine is much greater than many of us recognize. More and more of the veterans are being taken care of by the government, irrespective of the extent of their war service or the character and origin of their ailments. In one of the counties of this state the requirements for admission to the County Hospital have been lowered by the supervisors to the point where it is

estimated that 80 to 90 per cent of the population are eligible. The chairman of the Board of Supervisors has announced his intention of further liberalizing these requirements.

We must also bear in mind the fact that any scheme inaugurated in this state by political action will in all probability include provision for numerous types of irregular practitioners who are lacking in proper training.

CONCLUSION

In attempting the solution of these problems our conduct must be governed, not by emotion but by reason. Our action must be less obstructive and more constructive than in the past. We must be the leaders, not the led. Now, as never before, organization is vitally necessary for our future, and we must present a united front—not necessarily a battle front, but one based on calm study and on unity, and capable of being converted into a battle front should occasion arise.

711 Merritt Building.

ENVIRONMENTAL ALLERGENS*

WITH SPECIAL REFERENCE TO THEIR IMPORTANCE AND SPECIFICITY

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AND
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DISCUSSION *by Albert H. Rowe, M. D., Oakland; S. H. Hurwitz, M. D., San Francisco; Edward Matzger, M. D., San Francisco.*

IT is a rather common observation that some allergic individuals have respiratory symptoms in certain houses and not in others. A change from the unfavorable environment often results in complete alleviation of symptoms; and if the distance moved is significant the climate is probably given credit for the improvement. If the distance moved is but a few yards—such as to another apartment in the same building or across the street—it is more difficult to attribute the relief to altitude or weather conditions. Such patients may or may not react to the usual stock allergens, and if reactions are obtained they seldom explain the phenomena just described. The most logical approach to such a problem is to study the environment. Since the work of Cooke[1] considerable interest has been aroused in the part played by house dust. A thorough study of the environment, however, may require attention to a wide variety of substances such as epidermal structures from pets, pillows, furs, wool blankets, etc., and house dust from rugs, furniture, or draperies. Even though negative to stock allergens some individuals may react to an extract of substances from their immediate environment. That the reaction alone does not prove etiologic relationship of the dust to the patient's condition, we shall try to point out below.

* A majority of the patients used in this study were from the Allergy Clinic, Los Angeles County General Hospital, Unit No. 1.

† Formerly acting head nurse in the above clinic.

HOUSE DUST A COMPLICATED MIXTURE

House dust is a very complicated mixture, and may be contaminated by pollens or some of the epidermal structures mentioned above. On the other hand, the rug or furniture may actually be composed of material which specifically irritates the patient. One school of workers believes that the activity of house dust is dependent upon the bacteria, molds, and yeasts which it may contain. We are inclined to minimize the importance of bacteria as the source of the active substance in house dust extracts. In this connection it must be remembered that the literature contains reports of hundreds of negative, and but few positive, skin reactions to bacterial extracts. In fact, it seems that allergists are agreed on one point, namely, that tests with such extracts seldom give significant reactions. A few reports[2] of skin reactions with extracts of molds have appeared in the past few years. A careful study has recently been reported by Hopkins et al.[3] These workers isolated a species of Alternaria from an environment known to precipitate attacks of asthma in their patient. They were able to induce asthmatic attacks by permitting the patient to inhale a powder made from the "mat" or a spray from a broth culture. Intradermal tests with an extract of this fungus were strongly positive on the patient and on areas of the skin of a normal subject that had been passively sensitized with the patient's serum. Their experiments were carefully controlled and they are to be complimented on not drawing too sweeping conclusions from the single case studied. It would seem that this article deserves more serious consideration than any previous one on the subject. Again it should be emphasized that the failure to trace, to some extrinsic source, the irritating substance in any environmental allergen may be "due to an insufficiently exhaustive search."[4]

Stock extracts of house dust may produce skin reactions.[5]—often on a patient far removed from the source of this dust. Van Leeuwen[6] states that 80 per cent of his asthmatics react to stock "climatic allergens" and that all the dust specimens from private houses in Sweden, Germany, Austria, Poland, Italy, France, England, and Holland gave reactions on his patients. Rackemann[7] obtained positive reactions in 36 per cent of all asthmatics. Hopkins[3] gives other references to similar findings. If reactions to stock or irrelevant environmental allergens can be shown to occur on the majority of the patients tested, then they would have little significance in the individual case. The Council on Pharmacy and Chemistry is to be commended for refusing to accept[8] for "New and Nonofficial Remedies" such irrelevant substances as stock house and stock street dust.

ALLERGENS USED IN THIS STUDY

The environmental allergens used in this study were obtained in the homes of private patients. The source and possible relation of these substances to the particular patient exposed to them is discussed below. We have tried to determine whether extrinsic allergens contaminated them.

TABLE 1.—*Skin Reactions on Clinic Patients to Irrelevant Environmental Allergens*

Pt's. No.	Age in Years	Sex	Diagnoses	Sensitivities	Environmental Allergens A	B	C	D	E	F	G
1	24	M	Dys. R.	Epidermals	4	4	..	..	4	4	..
2	22	F	VMR	Epidermals, food, pollen (Sp. & F.)	4	4	..	..	..	2	..
3	15	M	H-F	Epidermals, pollen (Sp. & F.)	..	3	..	..	3	3	..
4	26	F	VMR, A	Epidermals, orris root	..	..	..	..	..	3	..
5	28	M	VMR, Dys, U.	Epidermals, orris root, fall pollen	4	4	..	..	4	..	..
6	33	F	A, H-F.	Epidermals, pollen	..	..	..	..	4	..	4
7	35	F	R.	Epidermals	..	..	..	..	..	..	3
8	38	F	A.	Pollens (Sp. & F.)	..	2	2	4	..	..	..
9	16	M	A.	Pollens (F.)	..	..	..	3	..	..	..
10	30	F	H-F.	Pollens (Sp. & F.)	..	..	..	3	..	..	..
11	19	F	H-F.	Pollens (Sp. & F.)	..	3	..	..	4	..	..
12	40	F	A, R.	Pollens (Sp. & F.)	2	2	..	3	..	3	..
13	18	F	VMR	Pollens (F.)	..	..	..	..	2	..	3
14	38	F	A.	Pollens (F.)	3	..	3	4	..	..	..
15	60	M	Dys, D.	Pollens (Sp. & F.), orris root	3	..	..	..	..	..	..
16*	21	F	D, R, Obs.	Orris root	..	..	..	..	4	..	4
17	15	M	A.	None	3	..	3	4	..	..	..
18	41	M	Dys.	None	2	..	..	3	..	..	..
19	48	M	Dys, (H.)	None	..	..	..	3	..	..	..
20	31	F	E, R.	None	3	..	..	4	..	..	..
21	32	M	A, R.	None	..	..	..	3	..	..	..
22	21	F	R.	None	..	..	..	..	3	..	..
23	31	M	Dys, R.	None	..	..	..	..	..	..	4
24	31	M	A, G-I.	None	..	..	..	..	..	..	4
Total patients positive to environmental allergens					7	5	2	10	7	4	6
Total patients negative to environmental allergens but positive to stock extracts					14	16	10	6	25	26	10
Total patients negative to environmental allergens and negative to stock extracts					20	23	21	17	23	34	23
Total patients tested to each special allergen					41	44	33	33	55	64	39
Per cent of these totals giving significant positive reactions					17	11	6	33	13	6	15

* Negro.

Note: Allergens B, E, F and G represent epidermal structures. The greater number of the reactions to the first three of these and to dust "A," which probably contained dog dandruff, were obtained on patients sensitive to stock epidermals. This further emphasizes the specificity of these tests. See text for key letters.

Each one reported in this study gave a positive reaction on the individual who had been exposed to it. The possible significance of such reactions is pointed out. In an effort to determine the degree of specificity of these extracts they were tested on a large series of clinic patients. It is practically certain that none of these patients had ever before contacted these substances, and it would seem far-fetched to assume that identical irritants were present in their own environment. An attempt has been made to correlate the skin reaction, especially in the clinic patients, with the possible presence of contaminating substances (pollens, epidermals, etc.), to which they may be sensitive.

DESCRIPTION OF SPECIMENS

Each environmental allergen has been given a key letter in the following paragraphs and in the table.

Specimen "A."—Rug dust, probably containing dog dandruff, from home of O. J. E., a white male, aged forty-three years, who complained of dyspnea, wheezing, sneezing, itching of eyes and injection of conjunctivae. He has had wheezing during the past fifteen years and has been subject to severe bronchitis since a child. His attacks were not seasonal and were usually worse in the daytime. For many years he has been a pastry cook and he has suspected that wheat flour aggravated his condition. A strongly positive reaction was obtained to wheat, by scratch as well as by intradermal test; moderate skin sensitivity was demonstrated to spring pollen and to rabbit dandruff. The dust specimen was collected in January, but in this climate that does not exclude the presence of some pollen; he owned several dogs, so their dandruff undoubtedly contaminated the specimen. A suspicious reaction was obtained to the extract made from his dog's hair and a definite reaction to the extract of rug dust.

Specimen "B."—Feathers from pillow used by A. H., a white male, aged twenty-nine years, who complained of frequent "colds" in his head and attacks of hives. For several months urticaria was present practically every day and was always worse at night. Between the ages of fourteen and sixteen years he frequently had sick headaches (migraine ?). These were so severe that he was unable to go to school during the attack. His family history is interesting in that his mother had migraine and urticaria. Allergic tests to foods were entirely negative, but he gave definite intracutaneous reactions to all epidermals, and a strongly positive one to the extract of feathers from his pillow. He had very satisfactory relief from urticaria after eliminating feather pillows and by the use of Rowe's [9] diets.

Specimens "C" and "D."—Rug and furniture dust, respectively, obtained from the home of D. N., a white male, aged thirteen years. His complaints were: wheezing, nasal obstruction, and sneezing. His condition seemed to be worse during damp weather, though he was relieved at the beach. He has spent several periods of from three to eight months in an outdoor camp about twenty miles from his home and has never had any of the above symptoms while at this camp, irrespective of the kind of weather. Symptoms recurred shortly after his return home. He had no pets and he slept on a feather pillow at camp as well as at home, so epidermal structures did not appear to be the exciting factor in his home environment. In order to further test this observation he was sent, during an attack, to live with his sister a short distance from his own home. There was no significant change of climate, altitude, or food. He recovered from the attack in two days and remained free for the remainder of the two weeks' visit. Symptoms returned within a few hours after he went home. "C" represents dust from the dining-room rug, and "D" is from overstuffed furniture in his home. The dusts were collected in November 1928 and undoubtedly contained fall pollens, including Bermuda grass. A four plus intradermal reaction was obtained to "C," and specimen "D" gave a three plus scratch and a marked four plus intradermal reaction. He

failed to react to any stock allergen. It would seem that these observations establish the etiologic importance of house dusts in his case.

Specimen "E."—Feathers from pillow. M. K., white male, aged thirty years, had a sudden return of the asthmatic syndrome—the first for two years. At the age of six to eight years he began to have hay fever and asthma; this was worse in spring and summer. For several years the attacks have not been seasonal and have recurred only at long intervals. He has suspected epidermal structures and believes this last attack to be caused by a small rabbit which had just been given his child. He was markedly skin sensitive by intracutaneous test to all stock epidermals and to several spring and summer pollens. Rabbit hair gave a four plus reaction by scratch. The extract of feathers from his pillow was positive by the intracutaneous test. Treatment of this case was limited to excluding rabbit and feather dandruff from his environment. In spite of the reactions to pollens, he was not treated with these extracts because it was felt that he would again become symptom-free after removing the evident cause of this attack. This assumption has been amply supported by the fact that he has been practically free from symptoms for more than twelve months.

Specimen "F."—Dog dandruff. R. R., a white male, aged thirty-three years, complained of symptoms typical of hay fever and asthma. He had spring hay fever, though nasal symptoms would appear at any time when he contacted horse dandruff. His occupation—teaching natural sciences—brought him in contact with epidermal structures from a wide variety of animals; in addition he had a small menagerie at home. He was strongly positive, by the dermal method, to the most important spring and fall pollens and to several foods. Wheat, egg white and yolk, orris root, and most of the epidermals gave him a four plus intracutaneous reaction. His dog's dandruff (specimen "F") and an extract of feathers from a parrot in his office gave positive reactions.

Specimen "G."—Feathers from pillow used by R. M., a Mexican boy, aged ten years. He complained of frequent "colds" in chest, wheezing, dyspnea, and some itching of the eyes. Except for feather pillows he had no known contact with epidermal structures. He failed to react to pollen and foods. Strongly positive, intracutaneous reactions were twice obtained to dog and rabbit dandruff. The reaction to stock feather extract was suspicious on two examinations and that from his pillow was definitely positive.

METHODS

The solutions used in this study were prepared by extracting the material in phosphate buffer mixture, containing 0.5 per cent phenol, for a period of forty-eight to seventy-two hours, and filtering through a Seitz filter. The filtrate—a clear, sterile solution—was tested by the scratch and then by the intracutaneous method. We attached little significance to the reactions unless they were typical—urticaria-like with pseudopods, etc.—such as one obtains to pollens in a sensitive patient. It has been stated [7] that such reactions are not the rule; any other reaction may be only the response of the skin to a nonspecific irritant. It is well known that such extracts seldom give positive reactions by the scratch method and this has given rise to the assumption that those obtained by the intradermal tests are nonspecific. Methods have been devised [10] for concentrating house dust extracts and such concentrated material has given positive reactions by the scratch test. In view of the fact that the patients are expected to pay for all procedures carried out in their behalf, complicated methods are hardly justified unless they have marked superiority over the simpler procedures.

KEY LETTER INTERPRETATIONS OF TABLE 1

In Table 1, all the diagnoses have been indicated by key letters and these are explained below. An attempt has been made to distinguish between conditions that may have similar presenting symptoms. For example, not every patient who complains of wheezing has true bronchial asthma, and the individual who "catches cold" when exposed to a draft probably has a vasomotor instability which may or may not be associated with a sensitivity to pollen or other allergen. Key letter interpertations in Table 1 are as follows:

"Dys"—Paroxysmal dyspnea, not entirely typical of bronchial asthma. If followed by "H" it suggests the possibility that the dyspnea may be due, in whole or in part, to cardiac dysfunction.
"A"—Bronchial asthma.
"R"—Rhinitis; complaint may be frequent "colds"—not typical of hay-fever, etc.
"VMR"—Vasomotor rhinitis; evidence of marked instability of the vasomotor apparatus of the nose.
"H-F"—Hay-fever, pollinosis.
"G-I"—Abdominal or gastro-intestinal allergy.
"D"—Dermatitis (type ?).
"E"—Eczema.
"U"—Urticaria.
"Obs"—Obesity.

The degree of reaction to each allergen has been indicated by the figures usually employed, namely, 2, 3, or 4, the last mentioned indicating the strongest, while "2" indicates a suspicious, though probably negative, reaction.

COMMENT

One hundred and five clinic patients were used in this study. Only those reacting to one or more of these special allergens are described in detail. The summary at the bottom of the table may enable one to visualize all the results obtained. The patients represented all ages from adolescence to the fifth or sixth decade. Several races, and a wide variety of allergic and possible allergic conditions are covered in the series. Patients 1, 2, 5, 9, 10, and 14 are Mexicans. All are sensitive to stock extracts as well as to the special ones under study. Most of these individuals have asthma or hay fever, or both. This is not in accord with the early observations of Phillips,[11] who stated, "I have never seen a Mexican with hay fever or pollen asthma."

From 6 to 33 per cent of the cases tested gave positive reactions. The furniture dust ("D") reacted on approximately 33 per cent of those tested; of this number about half were sensitive to pollen and the remainder failed to react to any of the commonly used allergens. Eight of the ten reacting (24 per cent of the total tested) complained of dyspnea; several of these probably had true bronchial asthma. This extract is the only

one that in any way approached the findings of Van Leeuwen and the other workers mentioned above. The other dusts ("A" and "C") reacted on 17 and 6 per cent, respectively, of the cases. It is therefore possible that extract "D" contained a nonspecific agent which would account for the greater number of reactions. If so it is not clear why this extract was not active on the several patients who were positive to stock allergens and on the larger number who were negative to all test substances. Our experience would lead us to expect no marked variation in skin response, in sensitive or nonsensitive patients, to nonspecific irritants, including histamin. The possible etiologic significance of this dust in the patient exposed to it has been indicated, though these findings tend to place most emphasis upon the other specimen ("C") from his environment.

In many instances an allergic study is not complete until there has been included a rather detailed investigation of the allergens in the immediate environment of the patient. Additional evidence of the importance of epidermal structures may be obtained by an extract of feathers from the patient's pillow. Extracts "B" and "G" gave strong reactions, while stock feather extracts gave but suspicious reactions in each case. Skin reaction obtained to these special extracts must be interpreted in terms of the particular patient. Clinical trial may be a valuable method of indicating the significance of these reactions. Before one advises a patient to dispose of his furniture—even though he reacted to an extract of the dust—it might be well to see if he would improve on avoiding contact with the suspected articles. When reactions are obtained the relationship to extrinsic substances must be given serious consideration. A patient now under treatment was found strongly positive to house dust by another allergist and treated with such an extract with a fair degree of relief. Subsequent study revealed many reactions to pollens, and treatment with appropriate pollens has given complete relief; house dust was entirely disregarded in this instance.

Our failure to demonstrate skin sensitivity to irrelevant (special) allergens in so large a percentage of these clinic patients, while not in accord with some other authors, may argue for the specificity and significance of (to the original patients) our extracts. Van Leeuwen has shown "that house dust from places known to be good for patients with climatic asthma contains much less allergen than that from places known to be bad." This might permit of at least two conclusions: first, that the climate of Los Angeles is "good" for asthmatics; and second, that the several dusts with which he worked contained material, possibly molds, not found in the environment of the patients I have studied in this and other groups. In any event it does not appear that the use of stock dusts of unknown source and composition would aid in solving the problem.

CONCLUSIONS

1. Extracts of house dust and other environmental allergens may give skin reactions on an allergic patient whether he be sensitive or nonsensitive to stock allergens.

2. These reactions appear to have a rather high degree of specificity, when one considers the possible contaminating factors such as pollens, epidermals, orris root, molds, and many other substances. There still remains the possibility that a rug or other article actually contains a specific factor not included in the ordinary set of stock allergens.

3. Satisfactory relief may not result until these special irritants are detected and controlled.

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DISCUSSION

Albert H. Rowe, M. D. (242 Moss Avenue, Oakland).—The study of the patient with bronchial asthma, perennial hay fever or dermatitis from the point of view of environmental allergens is most important. Doctor Lamson's care in describing the source of each extract which was used in his study is worthy of record. The routine testing of such patients with eight or ten stock house dust extracts frequently indicates unsuspected tendencies to such sensitizations. Specific reactions to various inhalant allergens, such as those of animal emanations, orris root, pyrethrum, fungi, pollens, etc., frequently offer possible explanations for the reactions to stock dust extracts. In 1927, I reported the occurrence of reactions to various inhalant allergens in patients reacting to house dust extracts.

Where marked pollen or other types of allergy exists specific treatment often yields results without special attention to the dust reactions. Generally, however, I think it best to establish environmental control in the sleeping room and, if possible, in the

living room when dust reactions occur. By this I mean the removal of all material of animal origin from those rooms and the substitution of cotton or floss bedding, pillows, mattresses, and rugs. The floor, furniture, woodwork, walls, and curtains should be thoroughly cleaned with damp cloths at frequent intervals. In addition to these measures, desensitization with a mixture of several strongly reacting stock extracts is worthy of trial. Careful questioning of the patient will often indicate susceptibility to house dusts.

If the patient is asked to analyze the effect of various dust exposures, a davenport or chair, rug or coat may be found to be causing specific reactions. If the stock dusts do not react in such patients, special extracts as described by Doctor Lamson from the mixed house dust as well as dusts from special carpets or furnishings should be prepared. As I described in 1927, concentrated extracts can be obtained by just covering about twenty grams of the dust with the extracting fluid and, after two days, draining off this fluid and using it to extract a similar amount of the same dust. I have continued to obtain good reactions in most patients with the cutaneous method. In those patients failing to react to this technique the intradermal method is used.

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Samuel H. Hurwitz, M. D. (490 Post Street, San Francisco).—Doctor Lamson's paper presents a very important contribution to an interesting problem in allergy. When Dr. R. A. Cooke of Cornell University reported in 1922 a group of dust-sensitive asthmatics, he concluded that the active principle in the dusts to which they were sensitive contained a specific and unknown substance. This view has been upheld by some workers, and disputed by others. In our experience with dust-sensitive patients we have found two groups to exist. First, one in whom it is possible to demonstrate by careful and exhaustive tests sensitization to many biologically unrelated allergens and a second group who, although markedly sensitive to their own environmental dust, are negative to various animal hairs, pollens, foods, or miscellaneous test substances. We have, therefore, come to the conclusion that house dust extracts contain both specific and nonspecific allergenic substances.

The treatment of dust-sensitive patients is at times spectacular. Where elimination therapy cannot be successfully carried out, desensitization with a specific environmental house dust extract frequently gives excellent results. For the past four years, in the asthma clinic at Stanford Medical School we have had under close observation and treatment an interesting house dust sensitive patient whose history is worthy of brief comment. In 1926 a woman about thirty-two years of age came under our care. The physician who referred her remarked that "Mrs. H. is a terrible sufferer from asthma and nothing but hypodermics of morphin seem to relieve her." In 1923 she was advised to leave her home in Kansas and come to California, where her asthma continued unabated. Many cutaneous tests with the common animal epidermal, pollen, food, and miscellaneous proteins were all negative. Tests to both stock and autogenous house dust extracts, more particularly to the latter, however, gave very large reactions. Careful questioning elicited the information that this patient had brought all of her household furnishings with her from Kansas, so that she was exposed to the same allergens in California as she had been in her home state. Because the patient's economic status precluded any radical changes in her home, such as the removal of furnishings made from animal hairs and the creation of dust-free surroundings, we decided upon a course of desensitization with her own house dust extract. The results of treatment were extremely gratifying. It is now almost four years since treatment was commenced, and during this time the patient has had only several mild asthmatic paroxysms.

We are thoroughly in accord with Doctor Lamson's view that environmental allergens are of great importance in the diagnosis and treatment of many patients with asthma. Wherever tests with house dusts are carried out it has been our practice, where possible, to use extracts obtained from materials in the patient's own environment. These we feel have given us more valuable information than those carried out with stock dusts.

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Edward Matzger, M. D. (909 Hyde Street, San Francisco).—The widespread application of the brilliant work of Dr. R. A. Cooke of Cornell on house dust as a new etiological factor that he published in 1922 brings out the necessity of again emphasizing the fundamental principles as laid down by this original worker.

Doctor Lamson and Virginia Inman in this paper help to cast light on the unknown substances found in most house dust. The trend of recent work in allergy seems to be in the discovery of factors hitherto unrecognized. The work on molds has definitely rescued from this unknown group one additional factor.

The feature which strikes me most forcibly in this article is the emphasis laid to inhalant factors as a cause of bronchial asthma. This etiological group has been much snowed under, in the recent literature, by the occasional spectacular food cases which are reported so much more frequently than factors in the inhalant group.

The fact that positive skin reactions are obtained from these varied specimens of individual dusts in people who are not exposed to them emphasizes the importance of proper interpretation of positive skin tests. Positive skin tests demonstrate both actual and potential mucous membrane sensitiveness. Doctor Lamson points out the importance of clinical trial as the best method of evaluating the significance of skin sensitiveness. This feature is fundamental.

Further investigation along these lines must be encouraged. It is only by these efforts that the many empirically discovered successful methods can be made rational.

LARYNGEAL OBSTRUCTION IN CHILDREN*

REPORT OF CASE

By Rulon S. Tillotson, M. D.
Woodland

Discussion *by Edward S. Babcock, M. D., Sacramento; Barton J. Powell, Jr., M. D., Stockton; Orrin S. Cook, M. D., Sacramento.*

MOST instances of laryngeal obstruction in children allow ample time for preliminary investigation before instituting treatment. Time is also usually available for deliberately carrying corrective measures into effect. Occasionally, however, the symptom of dyspnea is of such character that immediate action is mandatory. The prompt institution of treatment in these cases is of life-saving importance.

The procedures of tracheotomy and intubation are employed for the relief of acute laryngeal obstruction.

HISTORY OF THE OPERATION

The first reference to the operation of tracheotomy is in the writings of Asclepiades of the

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* Read before the California Northern District Medical Society at Sacramento, September 30, 1930.

Craeco-Roman period of medicine.[1] The opening of the trachea and larynx in some of the earliest cases was carried out principally for the removal of foreign bodies and for intense angina. Bretonneau in 1825 is credited with having performed the first successful tracheotomy in croup. The history of the development of the operation of tracheotomy is very interesting; however, its review is hardly within the scope of this paper. Intubation of the larynx in croup was introduced by Bouchut in 1856. O'Dwyer (1840-1898) is given the credit for perfecting the instruments for the operation as it is now performed. It may be added that some physicians at the present time favor direct laryngoscopic introduction of the intubation tube in preference to the O'Dwyer technique.

Fig. 1.—Lateral x-ray film of the normal larynx. Cross (x) indicates site of ventricles.

Familiarity with the symptoms of acute laryngeal obstruction is important. The choice of a procedure for its relief should depend on the causative pathology, and on the period of time that continuation of treatment may of necessity be required.

By way of illustration of these facts an instance of acute laryngeal obstruction, relieved by tracheotomy, and progressing to complete recovery is cited.

REPORT OF CASE

H. D., male, age two, entered the hospital on November 25, 1929, with a diagnosis of pneumonia. Two days before the child had been seen by his mother in the act of swallowing some kerosene. He had a severe coughing spell and vomited immediately after. Gradually increasing difficulty in breathing had been noted from that time until his admission.

On examination the child was restless and showed marked distress on respiration. A loud inspiratory and expiratory stridor was heard. No cyanosis was observed. On exposure of the neck and chest a marked indrawing at the suprasternal notch during inspiration was noted with accompanying retractions in the supraclavicular fossae and the epigastrium.

A diagnosis of acute laryngeal obstruction with threatened asphyxia was made. A tracheotomy was immediately done under local anesthesia, according to Jackson's technique. The dyspnea was at once relieved.

An x-ray taken later of the neck and chest was negative. Subsequent direct laryngoscopic examination showed a marked redness of the entire glottis with swelling of the arytenoids, the region of the false vocal cords, and the subglottic area. No ulcerations or membrane were noted. A culture taken direct from the larynx proved negative for diphtheria. The cause of the laryngeal obstruction as suggested by direct laryngoscopic examination was a traumatic laryngitis from the aspirated kerosene.

Decannulation or permanent removal of the tracheotomy tube was not possible before the twenty-eighth postoperative day. Laryngeal exercises were carried out for several days prior to decannulation before the normal respiratory function of the larynx was reestablished. By first changing to a smaller tube, then partially corking the tube, with later complete corking, and gradually increasing the time as the patient allowed it, permanent removal of the tube was finally possible. The tracheotomy fistula closed nicely a few days after decannulation.

Comment.—In this case an x-ray of the chest, laryngoscopic examination, and the taking of a culture were not carriel out before a tracheotomy was done. The time necessary for these procedures would probably have been fatal to the patient, but they were later carried out to establish the character and cause of the obstruction.

The marked indrawing at the suprasternal notch as noted in this patient is the outstanding physical sign of acute laryngeal obstruction. The explanation for the indrawing is found in the fact that from the failure of the air to get through the larynx, the negative pressure established by the inspiratory expansion of thorax is not compensated for, and a drawing in of the unsupported soft tissues at the opening of the thorax results. This indrawing at the suprasternal notch, as has been stated by Jackson,[2] is never seen in the dyspnea of asthma, pneumonia, mediastinal or cardiac disease, unless laryngeal complications are present. As evidence that the significance of this sign is not appreciated the same author states that of 126 patients admitted to his clinic on whom a tracheotomy was necessary, one-half of this number had been diagnosed as asthma or pneumonia.

Cyanosis was not present, although suffocation was impending. Cyanosis should not be waited for as an indication for tracheotomy. The patient may die from exhaustion in his struggle for air, and cardiac failure may occur without the pronounced appearance of this sign. The restlessness was due to air hunger and is an important sign in the diagnosis of acute laryngeal dyspnea.

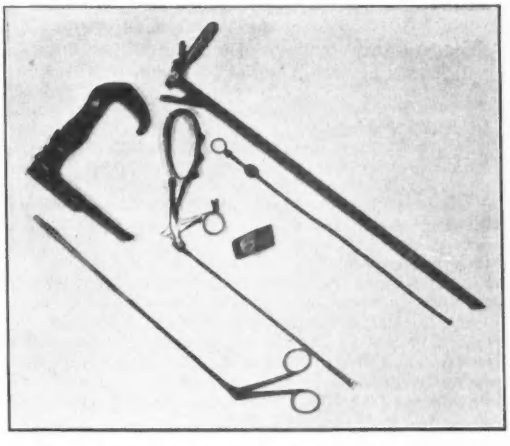

Fig. 2.—Instruments used in direct laryngoscopy.

The stridor was significant, as it was present in both the inspiratory and expiratory phase of respiration, indicating an obstruction to both the entrance and exit of air through the larynx. A similar type of stridor may be present in laryngeal diphtheria with the added factor that the child may not be able to cry, due to the presence of membrane between the cords. An inspiratory stridor with easy expiration and no loss of voice is suggestive of laryngismus stridulus, a condition where tracheotomy is rarely required.

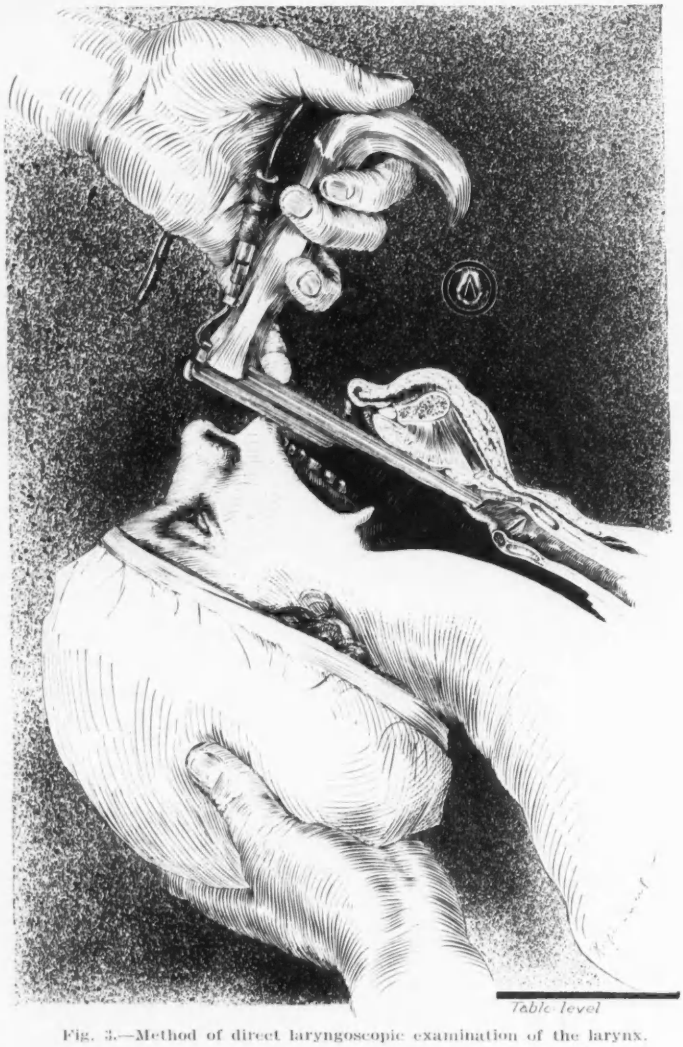

Fig. 3.—Method of direct laryngoscopic examination of the larynx.

TRACHEOTOMY AND INTUBATION

The selection of tracheotomy in preference to intubation as a measure to relieve the obstruction was due to the opinion that a tracheotomy, by putting the larynx at absolute rest, favored healing of any injury done by the aspirated kerosene. It was felt that an intubation tube inserted into an already inflamed and edematous larynx would excite and increase this inflammation, with a possible subsequent stenosis of the larynx. The fact that the safe removal of the tracheotomy tube was impossible before the twenty-eighth postoperative day rules out the question of intubation in this case. The latter procedure should not be employed where prolonged wearing of the intubation tube is anticipated. Difficulties in extubation and laryngeal stenosis may result from prolonged irritation by the tube. The great majority of laryngeal obstructions in children do not present emergency situations as in the instance cited, but allow sufficient time for making an exact diagnosis before treatment is begun.

The procedures which may be employed as aids in diagnosis are emphasized by the following case history.

REPORT OF CASE

E. J., male, age fifteen months, entered the hospital on February 27, 1930, with the complaint of difficult, noisy breathing. Three days before, the child had developed a croupy cough with accompanying difficulty in respiration. A few hours prior to admission he had a choking spell and became blue. The attack passed off after he coughed up some mucus, which apparently came from his throat. Temperature was 101.2 degrees, pulse 150, respirations 40.

On physical examination the child appeared extremely ill and in a state of prostration. The voice was faint and croupy, and a moderately loud inspiratory and expiratory stridor was heard. On exposing the neck and chest a limited amount of retraction was noted in the suprasternal and epigastric region during inspiration. Cyanosis was not present. The impression was that we were confronted by a moderate laryngeal obstruction, probably inflammatory in character; the marked prostration, the relatively low temperature, and high pulse rate suggesting diphtheria. An anteroposterior x-ray of the neck and chest was negative.

A direct laryngoscopic examination was made and a culture taken direct from the larynx. The glottis showed an intense reddening, with the vocal cords approximating poorly on efforts at crying. No ulcerations were noted. No membrane was present above the cords; however, below the cords in the subglottic region considerable tenacious exudate was noted. This was aspirated as thoroughly as possible. Breathing was less labored after this procedure.

The culture taken from the larynx showed the Klebs-Löffler bacillus, whose virulence was later checked by guinea-pig inoculation. Under antitoxin treatment the child recovered without further need of suction or other measures to relieve the obstruction.

Comment.—An anteroposterior x-ray of the neck and chest was negative in this case. Pancoast [3] has recently pointed out certain landmarks in the lateral view of the upper respiratory tract that are of diagnostic importance. The lateral view of the normal larynx shows a zeppelin-

shaped area of decreased density at the site of the ventricles. This landmark, as pointed out by him, may be obliterated or its outline disturbed in any one of three conditions, namely, cord paralysis, inflammatory conditions, or tumor. Pancoast has also pointed out that the normal width of the prevertebral soft tissues at the level of the laryngo-pharynx is about one-fifth that of the body of the underlying vertebra. Any increase in the width of this shadow, as would be present with a retropharyngeal abscess in this region, is of diagnostic importance. Pictures to demonstrate lesions in and about the larynx are taken laterally during the inspiratory phase of respiration in the child or during phonation in the adult. Since Pancoast's paper was given, we are routinely taking lateral as well as anteroposterior x-rays in our laryngeal cases for the additional information that these films may afford. Figure 1 shows the normal landmarks of the larynx and adjacent structures as referred to in this discussion.

Direct laryngoscopy should be carried out in every case of laryngeal obstruction. This procedure permits inspection of the larynx and the taking of a culture, if indicated, direct from the site of the lesion. Redness, edema, the presence of membrane, tumor, foreign body, and cord paralysis should be looked for. The instruments required for this work are shown in Figure 2. The method of direct examination of the larynx is shown in Figure 3. The use of a direct laryngoscope for the introduction of the intubation tube is shown in Figure 4.

Suction as used through the laryngoscope in this case is often of great value. Thorough aspiration of membrane, secretion, and crusts may eliminate the necessity of intubation or tracheotomy. The use of suction through the laryngoscope in the treatment of laryngeal diphtheria was reported several years ago by Grover and Hardman [4] at the Willard Parker Hospital in New York City. At the present time it is used in many of the larger hospitals for contagious diseases. Its value was recently cited in a large series of laryngeal diphtheria cases reported by Tolle.[5] In his report only 18 per cent required intubation where suction was used, while 41 per cent needed intubation where this measure was not employed. Its use is also of value in removing crusts, secretion, and membrane in nonspecific types of obstructive laryngitis.

Fig. 4.—Direct laryngoscopic introduction of the intubation tube.

LARYNGEAL OBSTRUCTION

Detailed case reports could be given, illustrating other types of laryngeal obstruction; however, the review of such cases would be time-consuming and include repetition of many points already amply stressed. For this reason a simple enumeration of the more important causes of laryngeal obstruction, with brief comments on the diagnosis and treatment of each type, is given.

Laryngismus Stridulus.—This condition, sometimes referred to as inspiratory laryngospasm, occurs in infants as a complication of rickets and malnutrition. Sir St. Clair Thompson [6] believes that the laryngeal obstruction is not due to spasm of the glottis, but to a collapse of unusually feeble laryngeal tissues during inspiration. The total absence of inflammation or membrane on laryngoscopic examination helps to establish a diagnosis in this condition. Tracheotomy is rarely required to relieve the dyspnea. In addition to the employment of measures of relief during the attack, treatment of the associated rickets should be carried out.

Laryngeal Diphtheria. The presence of membrane within the larynx or subglottic region and a positive culture of the Klebs-Löffler bacillus establishes a diagnosis of this condition. The treatment consists of laryngoscopic aspiration, antitoxin intravenously, with intubation or tracheotomy, if needed for threatened asphyxia.

Acute Streptococcus Laryngitis.—Intense reddening and edema of the larynx and often the presence of a dirty white exudate are seen in the laryngoscopic picture of this disease. The edema

may be present in the subglottic area. A culture of streptococcus, usually of the hemolytic variety, is obtained. The laryngeal condition in these cases is often a part of a severe respiratory infection involving the trachea and bronchi. Although relief of the obstructive laryngeal dyspnea may be called for and obtained by intubation or tracheotomy, the patient often dies due to the severe respiratory infection or one of its complications.

The treatment of these conditions may call for the relief of the laryngeal obstruction by intubation or tracheotomy. Streptococcus serum is used with benefit in some cases. Baum [7] reports favorable results in the use of foreign protein in the form of mixed respiratory vaccine given early in the course of the disease. In some of the milder cases we have used ephedrin sulphate, hypodermically, every four hours with definite relief of the obstructive laryngeal dyspnea.

Postoperative Edema of the Larynx.—This condition is sometimes seen following bronchoscopy, particularly in infants when the procedure is prolonged. We had such a case develop during the past year, following the successful removal of a foreign body from the right main bronchus. A low tracheotomy was done to relieve the acute obstructive laryngeal dyspnea. Moersch and Boothby [8] have pointed out the value of oxygen as a prophylactic for postbronchoscopic laryngeal edema in children. Their results seem to warrant its use routinely in these cases.

Laryngeal Tumors.—Papillomata are the most common benign tumors causing laryngeal obstructive symptoms in children. These tumors may be removed endoscopically without anesthesia.

Foreign Bodies.—The diagnosis is made by the x-ray, if opaque to its rays, or by direct laryngoscopic examination. The treatment is removal with direct laryngoscope and laryngeal forceps.

Bilateral Cord Paralysis.—This condition is characterized by firm approximation of the cords in the mid-line on laryngoscopic examination. Unless seen early and relieved by tracheotomy, the patient obviously dies of asphyxia.

A case of bilateral cord paralysis was recently reported by Tucker,[9] occurring in a child under one year of age. The bilateral paralysis was due to pressure of an enlarged thymus on both recurrent laryngeal nerves. Bronchoscopy, followed by tracheotomy over the bronchoscope to relieve the acute obstruction, and subsequent x-ray of the thymus were the procedures carried out in the treatment of his patient.

Direct laryngoscopic views of the above described conditions are given in Figure 5.

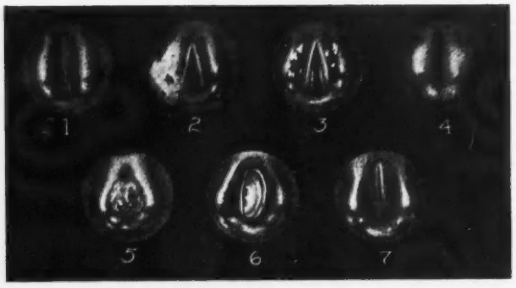

Fig. 5.—Direct laryngoscopic views: (1) Laryngismus stridulus (during inspiration). (2) Laryngeal diphtheria. (3) Streptococcus laryngitis. (4) Acute edema of the larynx. (5) Papillomata. (6) Foreign body. (7) Bilateral (abductor) cord paralysis.

SUMMARY

1. In most instances of laryngeal obstruction in children sufficient time is allowed for making an exact diagnosis before treatment is instituted. X-ray examination of the neck, with special attention to the lateral view, direct laryngoscopic examination, and the taking of a culture, when indicated, should enable one to make a diagnosis.

2. A few cases of laryngeal obstruction in children demand an immediate decision as to the treatment needed and prompt institution of this treatment to prevent loss of life. Recognition of the cardinal signs of acute laryngeal dyspnea is fundamental.

3. An enumeration of the more important causes of laryngeal obstruction in children is given. Brief comments are made on diagnosis and treatment.

Woodland Clinic.

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DISCUSSION

EDWARD S. BABCOCK, M. D. (Medico-Dental Building, Sacramento).—In the presence of laryngeal obstruction, when shall the attending physician call in the laryngologist and how can the need for instrumentation be prevented?

In the past, in moderate degrees of obstruction, common croup or non-diphtheritic laryngitis was usually the diagnosis until proven otherwise, as this was the most common condition seen. If diphtheria was suspected, perhaps ten thousand units of antitoxin were given intramuscularly.

Today, when trained laryngologists are always available, except in the remotest communities, and when our knowledge of diphtheria is more complete, this course seems inexcusable.

Children who have a general respiratory tract infection, with only a moderate laryngeal obstruction which is worse at night and subsides during the day, in most cases can be safely treated as having common croup. But where diphtheria is proven or is likely, large amounts of intravenous antitoxin, warmed, diluted and given slowly are indicated. We have given fifty to one hundred thousand units in several cases with recovery where instrumentation seemed unavoidable at the onset.

Active immunization of our child populace against diphtheria has materially reduced the incidence of laryngeal obstruction, but unfortunately only a very small number of those immunized are followed up with Schick tests to determine immunity.

When in doubt as to the pathology present or the course to pursue in treatment, no time should be wasted in calling the laryngologist.

❊

Barton J. Powell, Jr., M. D. (Medico-Dental Building, Stockton).—Fortunately for humanity, cases of laryngeal obstruction in children are becoming less and less frequent. The greatest single cause of this reduction is undoubtedly the early use of antitoxin therapy and prophylactic treatment of diphtheria. This disease is fast becoming an uncommon entity and the severity of those cases which do appear is usually attenuated. As Doctor Tillotson has brought out, direct laryngoscopic examination of all cases of laryngeal diphtheria with asphyxia should be done. By this procedure the exact condition of the structures can be noted, smears taken direct from the laryngeal mucosa and intubation readily accomplished. Intubation by direct laryngoscopy affords a quicker and surer method and will, I believe, supplant the older methods where the field of operation is hidden from view.

A frequent cause of acute laryngeal obstruction in children is the inspiration of foreign bodies. These usually demand immediate action. A foreign body on the aryteno-epiglottic folds, or even in the cavity of the larynx, can often be dislodged with the finger and the patient subsequently expel it by coughing. Care must be taken with this procedure not to force the material through the glottis. In cases where the obstruction is partial and asphyxia is not impending, direct laryngoscopy should be done and the foreign body removed with the laryngeal forceps. Where time and opportunity permits, roentgenograms are often helpful in locating the object.

Doctor Tillotson has stressed the indications and advantages of tracheotomy and I wish to again emphasize the importance of this life-saving procedure. The operation is neither difficult nor serious. There is little operative trauma, and complications are rare. Tracheotomy should be done in every case where asphyxia is impending and where the less radical procedures do not immediately supply the required relief. This excellent operation is only too often regarded as a last-moment attempt to ward off exitus. When the indications are present, perform tracheotomy immediately. Do not wait until the patient is in extremis and thereby severely jeopardize a favorable prognosis.

❊

Orrin S. Cook, M. D. (Medico-Dental Building, Sacramento.)—Fortunately or unfortunately the roentgenologist has the opportunity of seeing very few cases of laryngeal obstruction. Most of these cases are acute and are diagnosed without waiting for an x-ray examination. Most of the patients whom we see are those where foreign bodies lodge in the larynx. This is comparatively rare, but occasionally does happen. If the foreign bodies are radio-opaque, the x-ray is of considerable assistance, but if they are radio-lucent the x-ray does not help.

The only other condition which I have seen with any frequency is retropharyngeal abscess. This condition in the advanced stages gives a bulging of the posterior wall of the pharynx in the lateral view which is quite diagnostic.

❊

Doctor Tillotson (Closing).—I have endeavored in this paper to stress the cardinal signs of laryngeal obstruction and point out the measures at our disposal in determining its cause. The procedures employed in maintaining a patent airway in this portion of the respiratory tract have been given. I agree with Doctor Powell that the operation of tracheotomy is not difficult or serious, with the qualification that the incision in the trachea should always be made below the first tracheal ring, avoiding injury to the cricoid cartilage. Injury to this cartilage may result in chronic laryngeal stenosis. After-care in keeping the tracheotomy tube and trachea clean, using suction if necessary, is of the greatest importance in avoiding post-tracheotomy complications.

BACTERIOPHAGE AS A THERAPEUTIC AGENT IN GENITO-URINARY INFECTIONS*

By E. W. Schultz, M. D.
Stanford University

INTRODUCTION

WILL ROGERS claims that all he knows is what he reads in the newspapers. All I can claim to know regarding the therapeutic merits of bacteriophage in genito-urinary infections is what I have read in the clinical reports sent to my laboratory. Whether the source of my information is any more reliable than that of Will Rogers' is problematic. Despite this uncertain status of my knowledge your program committee has had the courage to invite me to dispense something more or less authoritative on a singularly intricate question—has bacteriophage a place among therapeutic agents of value to the urologist? I must admit at once that I have failed to bring you a categorical answer to this question. To some this may represent the equivalent of a negative reply, but this is not necessarily the case. With any therapeutic procedure which does not yield uniformly successful results—and these are rare—one should not allow himself to be led astray by the failures which may initiate or sprinkle an inquiry. A procedure may have inherent merits, but these may not be fully revealed until the various factors which influence the result have been determined and, if possible, brought under control. Though we recognize that Nature yields up her secrets with great reluctance, we are often apt to draw conclusions long before the evidence is in. Indeed, some of us find the path a little too irksome and are inclined to seek a way out in logic whatever the original premises may perchance happen to be. We cannot escape the fact, however, that, while people may argue indefinitely (as it is said they once did) as to

*From the department of bacteriology and experimental pathology, Stanford University, California.

*Read before the Western Branch of the American Urological Association, November 6, 1931.

whether or not a fish when put into a full bowl of water will cause water to flow out of the bowl, the only way to really settle such a question is to actually put a fish into the bowl and observe the results.

HOW THIS STUDY AROSE

Several years ago, during a period of a great discussion for and against the possible merits of bacteriophage as a therapeutic agent, it occurred to us that a more satisfactory way to settle this question might be to provide a special service which would enable interested physicians to determine by *actual trial* the therapeutic merits of this agent. It was obvious that the commercial products which were beginning to appear on the market would not be likely to clear the atmosphere. It was clearly apparent from a review of the literature that only the most suitable 'phages for each individual case should be provided to the physicians actually on the firing line of such an investigation. The physicians using the service which we inaugurated have reported their results to us, and it is to these clinical reports that I shall refer in this paper.

THE PHENOMENON OF BACTERIOPHAGY

We find that there still are some physicians to whom bacteriophagy is either an essentially unknown phenomenon or regarding which they have very fragmentary knowledge. This may seem a little surprising in view of the fact that nearly twelve hundred papers have appeared in biologic and medical literature bearing on various aspects of the phenomenon, but it may not be generally known that very good reviews,[1] presented from different viewpoints, are now available in both American and British literature for the benefit of the English reader, not to mention some of the briefer reviews which accompany some of the clinical reports. Since there is still some haziness regarding the essential features of this phenomenon, a brief survey may be welcome before we take up an analysis of the clinical results.

The phenomenon of bacteriophagy may be defined as the lysis of bacteria by an infravisible agent of unknown nature, regenerated at the expense of the bacteria dissolved under its action. The lytic principle itself (bacteriophage) is often referred to as *transmissible bacterial lysin* for the reason that it may be distinguished from all other bacteriolytic agents by the fact that it is regenerated and increased during the progress of bacterial lysis, a drop of one dissolved culture being all that is necessary to initiate dissolution of the next. In a series of any length the culture finally dissolved will present about the same concentration of bacteriophage as the original filtrate, provided, of course, that suitable conditions for bacterial growth and multiplication are offered. An interesting aspect of the phenomenon is that young growing cultures seem to be necessary for its normal progress. Indeed, once added to a young culture, bacteriophage gives impetus to bacterial proliferation, causing the young, already rapidly dividing cells, to be plunged into an orgy of reproductive activity. During this active bacterial proliferation, individual cells begin to swell and rupture in an explosive manner. With rapidly increasing momentum more and more organisms disappear in this manner, with the result that in the course of a few hours after the onset of the phenomenon a highly turbid broth culture may become entirely clear and essentially free of organisms. Since bacteriophage exercises a growth-stimulating action on young cultures followed by an explosive rupture of individual organisms, the result of a sudden influx of water into the cell, certain investigators have concluded that bacteriophage may be an enzymic principle acting in some way on the surface membrane of bacteria, causing a sudden influx of water, resulting in an explosive rupture of the cell. On such an assumption one might define *bacteriophage* as a malign influence which plunges bacteria to an early death as a result of *"fast living"* and *"too much drinking."*

What the precise nature is of the agent responsible still remains a mystery. Not a few theories have been advanced in explanation, but, unfortunately, not one of them can be said to have the support of *all* the facts. So far as its possible usefulness as a therapeutic agent is concerned, it matters little whether the agent is a living virus; a ferment elaborated by tainted microbes, or of some other nature. The important fact is that it is a transmissible lysin which impresses itself on susceptible organisms. I say "susceptible organisms" because bacteriophages capable of attacking some organisms are often entirely unable to impress themselves on others. Indeed, a 'phage active for a given bacterial species is frequently entirely incapable of attacking some of the strains of that particular species. 'Phages differ widely in this respect. Some may possess a very wide range of activity, spreading their activity over several bacterial species, while others may restrict their activity to a single strain or two of a given species. This difference in range of activity represents one of the chief stumbling blocks in an inquiry designed to elicit the value of bacteriophage as a therapeutic agent. Without preliminary laboratory tests it is impossible to say whether or not a given 'phage will lyse, even in the culture tube, an organism responsible for a given infection. While it is possible by the selection and pooling of an adequate number of different 'phages to somewhat overcome these uncertainties, it is obviously impossible to study the therapeutic merits of bacteriophage without definite knowledge that the causal organism is lysable *in vitro*.

Not only do 'phages differ in the range of their activity, but they differ widely in the intensity and completeness with which they effect lysis. While the differences which may be exhibited is not wholly a function of the 'phage, but of the organisms as well, the selection of more active "virulent" 'phages for therapeutic studies is, nevertheless, exceedingly important. The ideal 'phage for therapeutic trial is obviously one which

1 d'Herelle, 1926, 1930; Brugnoghe, 1927; Hadley, 1928; Schultz, 1929, 1930; Twort, 1930; Burnet, 1930.

not only causes complete lysis of the cultures of the causal bacterium, but one which tends to hold in check the appearance of the so-called *secondary cultures*. Such 'phages, however, are the exception rather than the rule, and this is particularly true of 'phages active for the colon group of organisms. With these organisms, secondary 'phage-resistant variants almost invariably make their appearance in unfiltered lysed cultures within twenty-four to forty-eight hours after maximum lysis, especially if optimum temperature conditions prevail. There are, on the other hand, instances in which unfiltered cultures remain clear for days, and even for weeks. We have, for example, in our possession a staphylococcus bacteriophage which generally holds the appearance of secondary cultures in check for longer periods of time. Lysed coli cultures, as I have indicated, generally show secondary cultures promptly, unless kept at low temperatures (15 to 20 centigrade). This tendency for 'phage-resistant variants to arise is not without bearing on the results of 'phage therapy. It should be added, however, that the appearance of 'phage-resistant organism in the tissues of the affected host does not mean that the patient is left with a more virulent infection. On the contrary, these 'phage-resistant variants are generally distinctly less virulent in character. During the past few years a great deal of work has been reported on the subject of *bacterial variation*. It has been found that cultures of most pathogens may naturally shift from the so-called "S," or smooth, more virulent types, to the "R," or rough types, which relatively are avirulent; the "smooth" forms giving rise to stormy, the "rough" forms to less stormy clinical pictures. I shall refer to this again later.

Bacteriophages have been isolated for many different species of bacteria, including members of the colon typhoid-dysentery group; the hemorrhagic septicemia group; the diphtheria and diphtheroid group; for the pyogenic cocci and many nonpathogens. For some of these it is much more difficult to find 'phages than for others. It is not difficult to find 'phages for members of the colon group, but very difficult to isolate those active for staphylococci, and especially for streptococci. While we have experienced no great difficulty in isolating 'phages active for various nonhemolytic streptococci, in only a few instances have we been fortunate enough to recover those active for hemolytic streptococci. This seems to have been the experience of other investigators, for there is scant reference to streptococcus 'phages in the literature. Contrary to the experience of other investigators we are able to lyse hemolytic as well as nonhemolytic variants of *Staphylococcus aureus*.

The sources of 'phages are varied. The feces of man and animals; normal, diseased, and convalescent, present 'phages in varying quantities and of different ranges and degrees of activity. The most commonly used source is sewage; the sewage of large cities being more promising than that of smaller towns. Healing wounds offer another source, as do also nasopharyngeal washings: sources which should in reality be studied more carefully, especially for 'phages active for the pyogenic cocci. The urine from cases suffering with chronic cystitis may, as Larkum (1926) and others have shown, frequently contains a bacteriophage of weak or moderate activity. Sewage has the advantage in that it contains a rich mixture of 'phages, all of which may be revealed if we take the trouble to test the sewage filtrate simultaneously against a sufficiently large number of bacterial species and strains. Recently we have begun the practice of feeding bacterial strains which we have been unable to lyse to various animals, including the horse, rabbit, dog, chicken, duck, and monkey, with, in the main, gratifying results. It is evident from what I have just said regarding the sources of 'phage that we do not, as some physicians seem to believe, "develop a bacteriophage from the cultures" sent us. There is no convincing evidence to support the view that bacteriophage may be developed from an originally 'phage-free culture.

LITERATURE ON BACTERIOPHAGE THERAPY

Those who are familiar with the basic aspects of the Twort-d'Herelle phenomenon find no difficulty in understanding why investigators quite early in the development of this new knowledge began to ask themselves why such an agent should not possess therapeutic merits. On theoretic grounds at least, bacteriophage possesses all the features of an ideal therapeutic agent, not only in being potentially able to destroy the causal agent, in the process of which it is regenerated, but in being at the same time, so far as all evidence goes, entirely harmless to the patient. For what other therapeutic agents may as much be said? With most therapeutic agents the germicidal activity *in vivo* must always be carefully weighed against the depressing, and even more damaging action, which they may exercise on tissues already the seat of more or less marked microbic injury. To say, however, that bacteriophage possesses, theoretically at least, the properties of an ideal therapeutic agent still leaves its actual practical usefulness an open question. An agent may be wonderfully effective as a germicidal agent in the test tube and at the same time prove relatively inert when applied against the same organism within the confines of an infected tissue. The actual proof must, therefore, always rest in the last analysis on careful clinical studies. In the case of bacteriophage there is, unfortunately, a relative dearth of significant clinical observations. While there are a number of reports in the literature bearing on its use in urinary infections, the individual series are for the most part small and not altogether satisfying. One gathers the general impression, however, from the great majority of the reports relating to the treatment of urinary infections by 'phage [2] that when

[2] Becherich and Hauduroy, 1922, 1923; Couroux, Philibert and Cordey, 1922; Alphonsi, 1924; Arloing, Dufour, Bouvier and Sempé, 1924; Phillibert, 1924; Pereira, 1924; Lehndorff, 1924; Zdansky, 1924, 1925; Frisch, 1925; Dalsace, 1926; Larkum, 1926; Cowie, 1926; Sickenga, 1925; Caldwell, 1928; Krueger, Faber, and Schultz, 1930.

properly chosen and properly administered the 'phage possesses well-defined therapeutic merits in the less complicated types of pyelocystitis. These results, together with the generally favorable trend of the reports bearing on the treatment of nonurinary infections such as furunculosis, carbuncles, and wound infections due to staphylococcus,[3] all seem to argue clearly for at least a further investigation as to its usefulness as a therapeutic agent.

RESULTS REPORTED TO OUR LABORATORY

A. *Bacillus coli, Pyelitis, and Cystitis:*

May I summarize now the clinical results which have been reported to us by physicians to whom 'phages have been supplied by our laboratory. The analysis of these reports has been far from a simple and altogether satisfying task, mainly for the following reasons, which I should like to unburden myself of at this time. Though we have endeavored to make clear to physicians using our laboratory service that our part in this coöperative endeavor is prompted solely by a desire for reliable information as to the therapeutic merits of bacteriophage, it has proven exceedingly difficult to secure the type of reports needed in a study of this sort. The following represent a few of the more common faults in rendering reports: (1) failure to give a complete clinical diagnosis. Indication as to whether pyelitis is *acute* or *chronic* is of far greater importance in a study such as this than information that the infection is on the right or left side; (2) failure to give a synopsis of the clinical history. This is especially important when the diagnosis is entirely omitted; (3) I believe you will grant that in a therapeutic study the size of the dose administered, the route, and the spacing of the doses should be carefully entered in a report, and yet, such pertinent information is not infrequently omitted from these reports; (4) the results realized by the treatment certainly deserve some comment, but this is also sometimes omitted. I should state, parenthetically, that in our directions on the report blank we have requested that clinical results be reported as "positive" only when there *seemed* to be no doubt as to relationship of the clinical improvement to the therapeutic procedure. One can, of course, never be certain that in the individual case the two are always directly related, but some significance can probably be attached to such observations when they relate to a sufficiently large number of cases. *Doubtful* as well as clearly unchanged clinical conditions we have asked the physicians to report as "negative."

Now, what do the reports on treatment of pyelitis and cystitis show? After discarding the incomplete records, there remained for analysis a total of 191 case reports; 40 of these relate to acute and subacute cases, and 151 to chronic cases. Let me reverse the order and present first the results reported on the chronic cases. Of the 151 cases in this series 72 were reported as "positive," while 79 were reported as clearly unchanged or "negative." That is, of the total number of chronic cases treated, approximately 47 per cent were thought to have been improved by 'phage treatment. Of this number, fifteen recurred *within* a period of ten days; one recurred after two weeks, and one after three months. It is possible that more than two recurred after the tenth day, but my information on this point is lacking. It is noteworthy that of the seventy-two cases which were recorded as having been improved, thirteen seem not to have become entirely free of the colon organism in the urine at any time, though in the minds of the physicians reporting these cases there was unquestionable clinical improvement immediately following the treatments; an improvement which, so far as my information goes, persisted for some time. In the light of our present-day knowledge regarding bacterial variation, either induced by 'phage or occurring naturally, such a therapeutic effect is not improbable. In such instances there is presumably a shift from the more virulent "S" type to the less virulent "R" type variants (Hadley, 1928). Returning to the case reports, if we now count out the cases which suffered recurrences, likewise those in which the organisms persisted in the face of clinical improvement, there remain in this series forty-two cases, or 28 per cent of the entire series of 151 chronic cases, regarding which there is, so far as I can ascertain, no question as to the immediate and apparently complete response to the treatment. Thirty-two of this number cleared up within forty-eight hours after the first dose of 'phage was administered; the remaining ten responding within seventy-two hours. Unfortunately, I have comparatively little information regarding associated anatomic disturbances in this particular group, but it appears that, with the exception of two cases of renal ptosis and two of prostatitis, the series seems to have been essentially free of more significant anatomic disturbances. However, in the series of seventy-nine cases which failed entirely to respond, associated pathologic states were indicated in the diagnosis or clinical histories of a fair number, and these complications included prostatitis, prostatic hypertrophy, epididymitis, renal ptosis, hydroureter, ureteral stricture, ureteral obstruction, renal and bladder calculi, pyelonephritis, diverticulum of the bladder, leukoplakia of the bladder, neurological bladder, renal tuberculosis, actinomycosis, metastatic cancer, etc. Quite apart from the question as to whether the 'phage would have precipitated recovery had the anatomic status of these cases been less abnormal, it seems scarcely proper to include cases of this type in a basic inquiry of this sort. I have gathered the impression that the bulk of the cultures we receive for 'phage susceptibility test are from cases which are more or less exasperating to physicians who in

[3] Bruynoghne and Maisin, 1921; Gratia, 1922; Sauvé and Jacquemaire, 1929; Raiga, 1929; Bazy, 1925; Larkum, 1928; Rozemon, 1929; Alderson, 1930; Crutchfield and Stout, 1930; Sauvé, 1930; as in the treatment of dysentery (d'Herelle, 1921; da Costa Cruz, 1924; Pereira, 1924; Spence and McKinley, 1924; etc.); typhoid and paratyphoid infections (Beckerich and Hauduroy, 1922; Hauduroy and Arsimoles, 1923; Hauduroy, 1925; Alessandrini and Doria, 1924; Smith, 1924; Richet, Azerad and Delarne, 1924; Breton, 1930; etc.

final desperation have said to themselves, "Well, now isn't this a case on which to test the therapeutic merits of 'phage?" This is a perfectly natural reaction, but is this the type of case on which to base such an inquiry? A sounder practice would seem to be to give alternate cases 'phage, and then compare the results with other forms of therapy.

(To be continued)

TETANUS*

By JOHN E. WRIGHT, F. R. C. S.
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THE tetanus bacillus is widely distributed throughout the world, but is more common in certain districts than others. It is very common in the tropics and in some of the tropical islands, where the temperature remains constantly fairly high, and under these conditions appears to possess an increased virulence. It occurs normally in the intestines of herbivora and to a lesser extent of other animals and man. It is found in 15 per cent of horses around New York. For this reason highly cultivated manured districts frequently contain the bacilli and spores in large numbers. The spores are extremely resistant, both to heat and chemicals, and can retain their vitality for years in a dry condition. By means of an infected splinter, Henrijean reports a successful animal inoculation after eleven years. It produces exotoxins, tetanospasmin and tetanolysin, the former with a special affinity for nerve cells, probably related to their lipoidal contents, the latter of little pathological importance. Susceptibility in different animals varies enormously. The amount of toxin sufficient to kill a fowl will kill five hundred horses. Under natural conditions fowls do not contract the disease, while horses under their extreme susceptibility are especially liable to contract tetanus following any wound. Man is almost as susceptible as the horse, and to him 1/300 of a grain of the toxin is a fatal dose.

Deep, contused and badly lacerated wounds, especially if a foreign body is present, are favorable but by no means the invariable accompaniment of infection. I have seen more than one case develop through feet infected with chiggers. The bacilli tend to remain localized to the point of infection and there multiply moderately and produce their exotoxin, which is taken up by the end plates of the motor nerves and travels by the axis cylinder to the central nervous system. A few may be transported by leukocytes.

The incubation period varies within wide limits, roughly from five days to three weeks, usually from ten to fourteen days. That is the time taken for the toxin to travel from the point of infection to the central nervous system. Symptoms appear earlier in tropical countries, sometimes within a few hours. The shorter the incubation period the worse the prognosis.

* From the Holberton Hospital, Antigua, British West Indies.

* Abstract of an address given before the Washoe County Medical Society of Nevada on June 9, 1931.

SYMPTOMS

The early symptoms are rather indefinite, but restlessness, irritability, insomnia, and sleep broken by terrifying dreams frequently occur. The existence of slight muscular rigidity or twitchings in the neighborhood of a suppurating wound should arouse suspicion and this is usually coupled with an exaggerated reflex response to gentle tapping of the muscles of the limb. Cases of local tetanus not infrequently occur on opening up and operating on old war injuries.

There may or may not be a peculiar grin, known as the risus sardonicus. The spasms spread to the trunk and limbs, which are exceedingly painful, violent, and exhausting, with only partial remissions; the patients usually remain quiet, probably from fear of provoking spasms. Fortunately the respiratory muscles are involved late. The slightest stimulus, *e. g.*, a draught, attempt at voluntary movement, or a banging door, is sufficient to throw the victim into violent spasms of a tonic character. The body is contorted and the respiration impeded with grunting and, indeed, muscles may be ruptured by the violence of the contractions on occasions.

A general rigidity, statuesque, is commonest in my experience, but an arching backwards of the spine (opisthotonus) is also common. Temperature usually runs from 101 to 103 degrees, but hyperpyrexia is not unusual. A moderate leukocytosis of 12,000 to 14,000 with a polymorphonuclear count of from 80 to 90 is the general rule. The unfortunate individual is only too conscious of his pitiable plight, shown by the look of terror which to me is almost characteristic. Death usually occurs in fatal cases in from three to five days from exhaustion.

Prognosis.—The prognosis is always serious. In cases in which symptoms show themselves under ten days it is about 40 per cent, but after three weeks it drops to about 15 per cent. Too often the disease is fully developed before treatment is commenced. Signs of bad prognostic import are hyperpyrexia, sleeplessness, strabismus, dysphagia, and respiratory involvement.

Diagnosis.—The most reliable test is to dilute some of the discharge from the deep parts of the wound with broth, divide it and inject one part into a susceptible animal, like a mouse or a guinea-pig, while the other is mixed with one cubic centimeter of tetanus antitoxin and injected into another animal. If the former develops tetanus while the latter escapes, there should be no doubt as to the diagnosis. Do not wait to establish a diagnosis in a doubtful case.

TREATMENT

In treatment the first and most important factor is to give a prophylactic dose of 1500 units to every case where a wound or injury may be suspected of harboring the bacillus, such as blank cartridge wounds, and wounds likely to be contaminated with soil or manure. If there are reasonable grounds for suspicion this dosage should be repeated at the end of a week or ten days. Subcutaneously, antitoxin is absorbed

slowly; it takes about forty-eight hours to reach its maximum concentration.

It is recommended that 10,000 units at least be injected intrathecally at the earliest possible moment under anesthesia, and 10,000 units intramuscularly at the same time, in any patient who presents any definite symptoms. I regard anesthesia as essential in these cases. If there is no improvement in eighteen hours these doses should be repeated, and it is sometimes necessary to do this daily on three or four successive days. The volume of serum injected intrathecally should, of course, be rather less than the amount of cerebrospinal fluid drawn off and run in by gravity. In cases which respond to this treatment it is still wise to inject 10,000 units daily until the danger of relapse is passed, as shown by the absence of spasms and complete muscular relaxation. Intravenous administration is not recommended, as therapeutically it is inferior to the intrathecal method.

Treatment of wound, if present, is important and requires judgment, and I strongly recommend before any manipulative treatment is undertaken that an injection of 10,000 units should be given intramuscularly.

Local Treatment.—Amputation well above the site of infection, excision of the wound, or local irrigation with oxygenizing antiseptics, and, of course, efficient drainage, are methods which may be used, according to circumstances. Carrel's method is often very useful, using hydrogen peroxid, hypertonic saline, or Dakin's solution, etc. Of these I prefer hypertonic saline with sodium citrate. Symptomatic treatment consists in keeping the patient quiet in a darkened room and removing all sources of irritation or stimulation liable to provoke reflex spasms. Chloretone in twenty-five grain doses in olive oil per rectum was useful in reducing nervous excitability.

No cases of local tetanus came to the Holberton Hospital while I was there. It is simply tetanus occurring in a person insufficiently protected or immunized, and characterized by local spasm and rigidity of the muscles adjacent to the wound. It is very rare except in after-war injuries, where the antitoxin injected at the time of injury was insufficient to give full immunity. It may show itself weeks or months after the initial injury, usually after further operative interference. The affected muscles show rigidity and spasticity and differ only in degree from the major tetanus, except in one respect, and that is, the stiffness tends to persist sometimes for months. It is practically never fatal if properly treated. Tetanus does not appear to be very common in the United States of America. For the one hundred thousand admissions into the Los Angeles General Hospital between 1916 and 1923 there were seventy-two cases of tetanus, or one in fourteen hundred admissions.

Even with this proportion, taking the country as a whole, it is not a condition which we can afford to neglect.

Medico-Dental Building.

RESUSCITATION OF THE NEWBORN: COMMENTS ON METHODS*

By ETHEL RIGHETTI, M. D.
San Francisco

DISCUSSION *by Dorothy A. Wood, M. D., San Francisco; Karl L. Schaupp, M. D., San Francisco.*

THE anesthetist as a member of an obstetrical unit, administering anesthetic agents to the mother, is increasingly called upon to aid in the resuscitation of the newborn, because of his familiarity with the apparatus and the gases used according to the newer conception of respiration.

Asphyxia neonatorum is the term applied to indicate an absence of breathing in the newborn. The circulation continues at birth, but there is an absence or failure of respiration, causing death. Respiration is initiated and regulated by the action of the blood gases, especially CO_2 on the respiratory center. Asphyxia results from interference with this gaseous exchange either before or after birth, through such causes as premature separation of the placenta, compression of the cord, delayed labor, the use of various drugs such as morphin, atelectasis of the lungs and intracranial injuries and pressure affecting the circulation of the respiratory center. Since varying degrees of intracranial congestion and the tendency to hemorrhage results from asphyxia, the method used in treating these infants often determines the outcome.

MANUAL METHODS HARMFUL

The manual methods, positively harmful, are still widely used. Swinging the child by the feet or arms increases cerebral congestion and may cause hemorrhage. Vigorous rubbing of the skin or spanking often cause hemorrhage and injury to the internal organs, as does also the flexion and extension method of resuscitation. The immersion of the child alternately in ice water and in warm water dissipates heat and produces or adds to shock.

Mild cases of asphyxia respond often to the Sylvester method of artificial respiration, and to the "mouth to mouth" inflation of the infant's lungs, provided only gentle pressure is used. Vigorous inflation causes emphysema. Drugs are valueless in asphyxia as respiratory stimulants. Adrenalin into the heart muscle may help to bolster a failing circulation pending the effective use of carbon dioxid and oxygen.

Commonly in the newborn, and particularly in the premature infant, more or less extensive areas of atelectasis are present in the lungs. The circulation is deficient in both carbon dioxid and oxygen and the respiratory center remains inactive or respiration is feeble and irregular.

CARBON DIOXID PROCEDURE

The physiological stimulant of the respiratory center is carbon dioxid. Given with oxygen which is essential to the vitality of the center and to the body metabolism, in mixtures of 5 per cent carbon dioxid and 95 per cent oxygen, we

* Read before the Anesthesiology Section of the California Medical Association at the sixtieth annual session at San Francisco, April 27-30, 1931.

have the logical treatment of asphyxia of the newborn. With the infant warmly wrapped and the respiratory passages free from fluid or meconium through gentle suction, these inhalations at a pressure no greater than six millimeters of mercury usually initiate respiration. They should be continued for several hours after respiration is established. Occasionally with more marked depression higher percentages of carbon dioxid must be used at the beginning. In infants with atelectasis the carbon dioxid therapy must be continued for several days or pneumonia will supervene.

This treatment usually suffices except in patients with severe intracranial damage. Where there are extensive hemorrhages or tears into the meninges, or brain injuries, treatment is most often ineffective. Lumbar puncture may relieve pressure due to hemorrhage. Artificial respiration by means of the Drinker respirator, along with the inhalation of carbon dioxid, has been successful in a small number of patients. If adequate ventilation of the lungs is secured and life maintained over a long enough period, it seems reasonable to conclude that the depression of the respiratory center may be overcome and a normal activity be established.

Anesthetists will be interested in applying the physiological therapy not only to resuscitate the asphyxiated infant, but to all newborns as a prophylactic measure to reduce the present high neonatal deaths from asphyxia and pneumonia.

319 Walnut Street.

DISCUSSION

DOROTHY A. WOOD, M. D. (1390 Seventh Avenue, San Francisco).—Resuscitation of the newborn, as Doctor Righetti brings out, is most successfully accomplished by the use of carbon dioxid and oxygen, usually in mixtures of 5-10 of CO_2 and 95-90 of O. The method of administration may vary, depending on whether the child has breathed spontaneously or not. If the child has breathed but its respirations are feeble in excursion, the low pressure cylinder with gas flowing through a wash bottle and connected by rubber tubing to a funnel, which can be placed beside the baby's face, is used. This can be continued for several hours or several days, as indicated. But if the child has made no attempt to breathe, then it is necessary to use a resuscitator which is automatically arranged to produce artificial respiration and so establish spontaneous breathing in the child. When the latter method is used, it is necessary that the respiratory passages be first freed from fluid and meconium that none of this material is forced down into the baby's lungs.

KARL L. SCHAUPP, M. D. (490 Post Street, San Francisco).—Doctor Righetti says that manual methods are positively harmful. This statement should be modified, for if properly performed, artificial respiration by "folding maneuvre," gentle spanking of the buttocks and stimulation of the skin are of great value. One must remember, however, that the tissue of a newborn child cannot stand a great deal of trauma.

The immersion of a newborn in cold tubs has no value in resuscitation, in fact it probably is the cause of failure more often than not. Hot tubs, on the other hand, are invaluable. Their use insures maintenance of normal temperature and is an excellent stimulating agent as well.

The use of five per cent carbon dioxid and 95 per cent oxygen is, to my mind, the best method at hand at the present time. However, to be effective the mixture must reach the lungs, which means artificial respiration or positive pressure. Both of these, by mechanical means, carry with them greater danger than when gentle manipulations are made by experienced hands. This is especially true in instances where there is a little excitement and haste is being made. Valves are opened too widely or proper adjustment of mechanism is not made, and the damage which results is irreparable.

ERYTHEMA INFECTIOSUM*

By HARRY C. COE, M. D.
Oakland
AND
By FRANK L. KELLY, M. D.
Berkeley

IN October, 1930, a small epidemic of erythema infectiosum occurred in Berkeley. Cases were also seen during the months of November and December. This epidemic aroused my interest, and on reviewing the literature I was surprised to find that erythema infectiosum had never been reported from California. In fact, very few epidemics have been described in America.

COMMENT ON THE BERKELEY EPIDEMIC

It is the purpose of this paper to briefly report the Berkeley epidemic and to review the findings in this exanthem in order that others may recognize the disease should it appear elsewhere in California.

Erythema infectiosum is one of the common exanthemata of childhood in Germany and Austria. It was first described in 1886 by Tschamer, who, however, believed it was an abortive type of German measles. Ten years later Escherich proved that it was a separate and distinct disease and in 1899 it was given the name erythema infectiosum by Stricker. In 1904, while working in Escherich's Clinic in Vienna, Shaw studied an epidemic of erythema infectiosum, and on his return to America in 1905 he wrote a very excellent and complete description of the disease in the *American Journal of Medical Sciences*.[1] His was the first report on this subject in the American medical literature. In 1926 Herrick reported the first epidemic of erythema infectiosum in America. His paper appeared in the *American Journal of Diseases of Children*.[2] Since then other epidemics have been reported from St. Louis, Hamburg, New York, and Ogden, Utah.[3] Although the disease was recognized thirty-five years ago in Europe and described in the American journals twenty-five years ago, it was not until four years ago that an epidemic was reported in this country. Erythema infectiosum is either uncommon in America, or it is being incorrectly diagnosed as something else.

Erythema infectiosum is a mild contagious disease of childhood, without subjective symptoms, and characterized by a maculopapular, rose-red rash, which is more pronounced on the face, legs, and arms. The etiology is unknown. Children between the ages of four and twelve are more often affected. Immunity is produced by an attack, but those immune to erythema infectiosum

* From the Dermatology Clinic, Berkeley Health Center.

Fig. 1.—Reticular, maculopapular lesion of erythema infectiosum on the inner surface of the thigh.

will contract German measles, and vice versa. This proves that erythema infectiosum is not an abortive type of German measles, but a separate disease.

After an incubation period of from six to fourteen days, and without any definite prodromal symptoms, there appears on the face a rose-red efflorescence. The maculopapular lesions are confluent, giving to the face the appearance of a bright red blush with a circumoral pallor. The skin is swollen and hot, but there is no itching. The lesions on the face disappear in about four days.

On the second day of the disease the eruption appears on the trunk and limbs. The rash is always more pronounced on the arms and legs, and in some cases the body may be almost free from lesions. The character of the lesions on the arms and legs is diagnostic of the disease. Circinate, confluent patches appear until the whole arm or leg is covered. This gives a lacework, or reticular appearance which is very striking. Evanescence of the lesions is quite pronounced, the rash may fade out but reappear when heat or friction is applied to the skin. The disease clears up within ten days without desquamation or scarring. Complications or sequelae are absent. There is no fever and the blood and urine are normal.

In differential diagnosis one must consider first, scarlet fever. The appearance of the lesions of the face in erythema infectiosum might suggest that disease. It is quite easily ruled out, however, by the absence of fever and the normal throat and tongue. Second, measles would be considered because of the morbiliform appearance of the body lesions. Absence of conjunctivitis, coryza, and the Koplik's spots will, however, exclude that disease. The annular appearance of the lesions might suggest pityriasis rosea as a third possibility. Absence of scales and the darker color of the rash of erythema infectiosum differentiates it from pityriasis rosea. Finally one must consider a dermatitis medicamentosa and a toxic erythema. The history solves the problem of a drug eruption, but I believe it would be impossible to exclude the diagnosis of a toxic erythema unless one were informed that the disease was contagious and epidemic.

In the Berkeley epidemic we saw ten patients, and undoubtedly there were others which were not reported to the health department. All of the patients were children of school age, living in the same neighborhood and attending the same school. No attempt was made to quarantine, and although the disease is contagious it must be very feebly so, otherwise there would have been a larger epidemic. No treatment was necessary with these patients as there were no severe symptoms of any kind, and the disease cleared up spontaneously. I am told that quarantine is not enforced in Austria, and children are allowed to attend school.

Figure 1 is a picture of a patient taken on the fifth day of the disease. You will notice the reticular lesions on the arm and leg which are typical of the disease.

CONCLUSION

Although erythema infectiosum is not a serious childhood disease and is only feebly contagious, it should be recognized and correctly diagnosed. A child should not be subjected to quarantine and the loss of time from school because an incorrect diagnosis of German measles or scarlet fever has been made. Physicians should be on the lookout for erythema infectiosum in California, as we now know that the disease is prevalent here. An epidemic skin disease of children characterized by maculopapular, reticular, evanescent lesions on the arms and legs should immediately suggest to the physician erythema infectiosum.

426 Seventeenth Street.
City Hall, Berkeley.

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THE LURE OF MEDICAL HISTORY

ESSAYS ON THE HISTORY OF EMBRYOLOGY*

II.

By A. W. Meyer, M. D.
Stanford University

SOME PUZZLING THINGS TO EARLY WRITERS

ONE of the most puzzling things to the earlier writers was the fact that many creatures and also they themselves existed as male and female, and that both sexes were essential for procreation. The sexual secretions such as the semen of the male and the catamenia of the female could, to be sure, not escape attention. Similar phenomena

* This is the second paper of a series of three articles. The first was printed in the December issue of California and Western Medicine, p. 447.

in other mammals also were obvious, and the idea that menstrual blood not only took part in the formation of the germ, but contributed its very substance, is a very old one indeed. It is mentioned in Susruta five hundred years B. C., and it lived on long after that in Aristotle and elsewhere. The male long was thought to contribute only the molding force and the female the substance.

These ideas seem fanciful to us, but even William Harvey concluded that the womb conceives the embryo as the brain conceives a thought. Harvey believed that coitus merely excites conception in the uterus as desire is generated in the brain, and the present use of the words conceive and conception is not without significance in this regard.

It is said that Pythagoras [1] regarded semen as a foam of the purest blood and as an excess of nutriment, an idea that persisted to the days of Harvey, but Pythagoras and others, such as Alcmaeon, Democritus, and Parmenides, held that woman also produces semen. This idea may have had a various origin, but since they knew the spawn of the female fish and the milt of the male, as well as the sexual discharges of amphibia, it is not improbable that the superficial similarity between the testis and the ovary and between the cervical, uterine and tubal secretions and semen, may have been partly responsible for this idea. The outward effects of castration both accidental and intentional, in both sexes, on animals and on the human male, must also have been known and it is likely that cases of sex reversal had been observed at this time.

The ancient Greeks did not stop at speculation or accidental observation, however, for Alcmaeon, a disciple and contemporary of Pythagoras, made observations upon the eggs of birds and concluded that the yolk was the formative and the egg white the nutritive material. The true rôle of these substances still was unsettled in 1868, when the great embryologist His considered the matter. Although Alcmaeon rightly regarded the brain as the organ of thought, he, as Aristotle, concluded that semen was a product of the brain and Parolles in Alls Well, spoke of "spending his manly marrow in her arms."

Aristotle says Empedocles thought that sex was determined by the temperature in the uterus. If hot a male results, if cool a female. He believed in the primacy of the heart in development, perhaps because the pulsating heart or punctum saliens is such a conspicuous object in an incubating egg. This conception of the rôle of the heart in development persisted until the sixteenth century.

Anaxagoras rejected the idea of female semen, held also by Aristotle, perhaps because he believed that semen came from the blood, but Anaxagoras thought that male individuals arise from sperm produced by the right and females from that produced by the left testis, an idea rejected by Harvey, who thought that sex was determined by an internal, inherent agent wholly

[1] For the ideas of the ancient Greeks I am indebted mainly to Bloch.

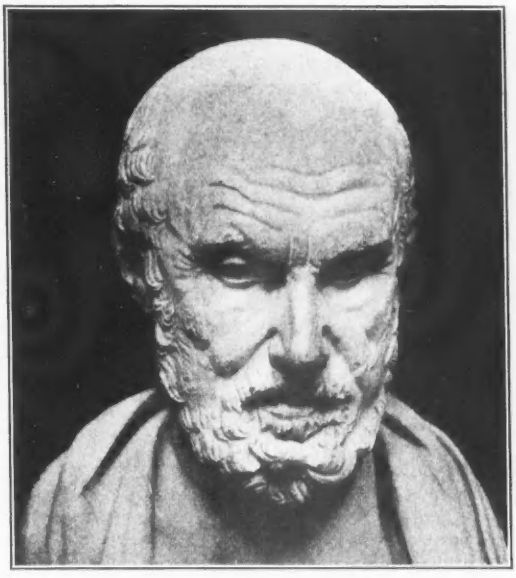

Fig. 1.—Hippocrates. (British Museum, second or third century B. C.)*

independent of the parents. The male and female were also once thought to develop in opposite sides of the uterus and a modified version of this idea was held also by Aristotle, and still is current among the laity of many lands today.

Democritus, a contemporary of Hippocrates, held that semen is a product of the whole body, an idea controverted by Aristotle who wrote: "For whereas they (the ancients) said that semen is that which comes from all the body, we shall say it is that whose nature is to go to all of it, and what they thought a waste product seems rather a secretion"; . . . "the ultimate secretion of the nutriment." Aristotle stated, however, that "there is evidence that the semen is in the catamenia, for, as said before, this secretion appears in the male at the same time of life as the catamenia in the female . . . " and continues to say that "the spermatic secretions" are produced by "the uterus and pudenda and breasts," including milk because it is a nutriment. Aristotle held that the loss of semen is exhausting because "the body is deprived of the ultimate gain drawn from the nutriment." The embryo to Aristotle was "the first mixture of male and female" and the ovum an oviform body found in the uterus, as it was also to Harvey. Hippocrates thought that maleness and femaleness are determined by the excess of male or female semen present at the time of conception. Aristotle, on the contrary, concluded that "the male is such in virtue of a certain capacity—and the female is such in virtue of a certain incapacity . . . to concoct the nourishment in its ultimate stage," that is, blood.

Although Anaxagoras thought that the head and brain develop first, perhaps because the latter is the seat of thought, Democritus held that the umbilicus is the first to form. This seems an

*The illustrations of Aristotle and Hippocrates are from Singer, Greek Biology and Greek Medicine.

amusing conclusion indeed, but the umbilicus was the place where nutriment entered and union with the mother was effected, and since Democritus inquired into the cause for the sterility of mules, we need not regard him as altogether benighted.

Although Plato lived somewhat later than Democritus, he believed that semen arose from the spinal cord and his speculations on embryology seem to fall far below those of his contemporaries. It hardly seems worth while to inquire further into them as expressed in his Timaeus.

DEFECTS IN THE PRE-HIPPOCRATIC EMBRYOLOGIC IDEAS

The chief defect in the pre-Hippocratic embryologic ideas lies in their detachment from sufficient purposeful observation and experiment. This is the great step forward shown in some of the Hippocratic writings, in one of which the surprising idea is expressed that all plants and animals have to some extent the same ground plan, and that one should therefore be able to apply the story of the development of the chick to that of other animals. That purposeful experiments in embryology were undertaken in that day is indicated by the fact that an unknown author of some of the Hippocratic writings tells us that one must put twenty eggs under a hen and take one out every day, beginning with the second day, and break it open in order to confirm the above idea. This procedure constituted a great advance, and it is extremely regrettable that the name of its author remains unknown to us and especially that the novel and fruitful conception of similarity between different forms of life fell upon sterile ground and remained unproductive for almost two thousand years until an Italian, Aldrovandi, recurred to it during the time of the Renaissance. After this it formed one of the most fruitful ideas in embryology.

It is puzzling why a Hippocratic writer thought that the earliest evidence of life in the human fetus felt by the mother, or quickening, occurred as early as the third month if the conceptus be male, but not before the fourth month if it be a female. Had these Greek writers but consulted the Greek mothers they could have obtained better information, and one wonders why they did not do so, unless it be that they mistrusted their own senses, and therefore also those of others as well.

OBSERVATIONS OF ARISTOTLE

Some of the observations and reflections of Aristotle upon the procreation and development of animals which are a continuation of those in the Hippocratic writings exerted a great influence on embryology up to the seventeenth century because of the authority of his great name. Indeed, some of the misconceptions found in Aristotle are still current today in other than lay circles. Aristotle, the master of them that know, as Dante called him, himself examined incubating eggs and his idea of equivocal or spontaneous generation of eels, some species of fish, insects, and worms, remained current regarding some forms of life until overthrown by the convincing

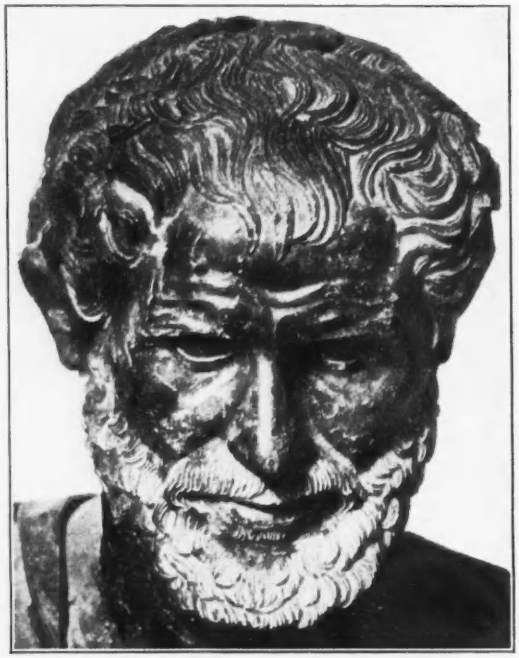

Fig. 2.—Aristotle. (From Herculaneum. Probably work of fourth century B. C.)

experiments of Pasteur. Aristotle suggested four methods of the origin of life and believed that the organic could arise from the inorganic and also from heat. Since the ancients believed that the inorganic also had a soul, such a conception of spontaneous generation should not surprise us. Nor should we marvel that Aristotle believed in the occurrence of parthenogenesis in higher forms of life. He could not detect the two sexes in all forms of animal life.

Aristotle regarded menstrual blood, in a sense, as the equivalent of semen, and held that menstruation in women is comparable to estrus or heat in mammals, an error still found in contemporary literature. He also held that the menstrual flow is comparable to the eggs of other animals, and that eggs form only through the influence of the male, the female supplying the substance and the male the energizing power, somewhat as we of today still use the word "fertilization" and incorrectly regard the spermatozoön as merely supplying a ferment to the ovum to inaugurate cell division. It is true that parthenogenetic development can be started artificially in some ova by chemical means as Loeb showed for the sea urchin, or by spermatic extract which presumably also is chemical, as Lillie discovered. This has not been possible in regard to the sperm but the two cells play an equivalent rôle in heredity.

To Aristotle the catamenia were imperfect semen which contained no soul because the male contributed the immaterial or controlling force. This idea was held also by Harvey, who believed, after Aristotle, that the cock contributes no sub-

stance but only an influence which makes the egg perfect and so initiates development. Aristotle carried this idea so far as to hold that the female partridge could be fertilized by the breath of the male, but it is not always easy to tell whether Aristotle is speaking upon the basis of observations or hearsay, as when he says that scorpions are born alive after the union of male and female. Anyone interested in Aristotle and Hippocrates will enjoy the essay by Singer.

Since the mode of reproduction of eels was not described till 1896 it is no wonder that Aristotle thought they had no generative organs. He never could find milt or roe and so concluded that eels arose from the entrails of the earth like certain worms. Aristotle was familiar with hermaphroditism in bees and with the occurrence of viviparous fishes. He knew the vitelline and allantoic vessels and the accompanying sacs and studied a twelve-day chick. He also knew something about the fate of the allantois and the yolk sac.

Since the medical school at Alexandria was known throughout the world for its enterprise in dissection of the dead, it seems as though the great men active there, such as Herophilus and Erasistratos, must also have made observations on embryology. There is no record of this, however, and one is left to pure surmise regarding this matter as regarding other things. The Alexandrians were supposed to have dissected the bodies of living men, but it has never been established that they did so. It does not seem unlikely, however, that some criminal might have been willing to take a chance on surviving an inspection of some part of his body under the knife of anatomists rather than suffer a cruel death after torture, and we must remember that dissection in that day meant something wholly different than now.

THE VIEWPOINTS OF GALEN

From Aristotle to Galen, during a period of about five hundred years, there does not seem to have been much of an advance in conceptions regarding embryology. Although Galen himself remained an authority in many things for a period of a thousand years, he added little of value to the ideas regarding prenatal life. He did, however, return to the idea of the existence of male and female sperm, and for a reason especially worth noting. This was because Galen found material which looked like semen in the uterine tubes of animals killed while in heat, and it is much to his credit that he carefully described this fluid. It should not surprise us that Galen confused the tubal, uterine and cervical secretions with semen, for long after Galen's day Haller and Kuhleman, who did some experiments in embryology and made many observations on hen eggs, could find nothing but white tough slime in the tubes and uteri in mammals two weeks after coitus; at a time when the conceptuses had already implanted and were several days old. However, Haller was extremely modern in many of his ideas, for he wrote: "The extremity of the tube, therefore, surrounding and compressing the ovarium in a prolific congress, is thought to press out and swallow a mature ovum, from a fissure in the outer membrane, from whence it is continued down by the peristaltic motion of the tube, to the uterus itself; which peristaltic motion begins from the first point of contact with the ovum, and urges the ovum downward successively to the opening into the fundus uteri, which is very manifest in brute animals. The truth of this appears from the constant observation of a sear or fissure in the ovarium, which is produced there after conception; from a foetus being certainly found in quadrupeds, both in the ovarium of the female, and in the tube; from the analogy of birds, in which the descent of the ovum from the ovarium is very manifest. Yet we must acknowledge, that a true ovum was never found in quadrupeds, unless after a long time. It is probable, that at the time of conception, the true ovum is almost fluid, very soft and pellucid, and cannot be distinguished from the mucus with which the tube is filled; likewise, that it is very small, on account of the narrowness of the tube." Even later than this, Wolff, whose work finally established the doctrine of epigenesis, announced by Harvey, is said to have drawn the figure of a hen egg representing the developing embryo in a chalaza of the egg, fully thinking that he had seen it there. It is said that he later recognized his error and never made the drawing public. Since the idea that the sperm enters the bird egg through the chalazae and that the embryo begins to form there is a very old one, it is possible that Wolff was influenced by these older conceptions.

Galen called attention to the fact that what he regarded as comparable to pollution in the male occurs also in women, and wisely argued, as had Aristotle, that if the male and female did not, in some measure, both share equally in procreation, inheritance could not occur from both parents. He went on to say that if there were only male sperm there could only be inheritance through the male, and if only female sperm then only through the female.

Although Aristotle had regarded the ovary and testis as unimportant organs, Galen regarded them as important and as equivalent, and emphasized their rôle in the body as indicated by their loss in castration. However, Galen recurred to the older idea as to the origin of semen, believing that it came from the blood, because, as he reasoned, emaciation and exhaustion follow too frequent loss of it. He did not think that menstrual blood plays a rôle in procreation, but concluded that female semen formed the allantois and that coagulation of male and female semen in the uterus resulted in the formation of the chorion. He spoke of four stages in prenatal development, the first of which he called *geniture*. During this stage the conceptus was said to be unformed and white like semen. In the second stage it became a *fetus*, but was said to be without liver, brain, and heart although vascularized. Galen seems to have suggested no special name for the third stage, in which the heart, liver, and brain were well

formed, but in which the external features still were largely unformed. In his fourth stage of prenatal life, *puer,* all of the organs were well formed and the joints freely movable. From this it is evident that this stage occurred relatively late in fetal life.

On the basis of their origin, Galen divided all parts of the body into two classes. One class of organs which was said to arise from sperm was called partes spermaticae, and the other class, partes sanguineae, because he believed they arose from the blood. This classification of Galen continued in use for several hundred years, and well illustrates the danger of speculation.

Galen wrongly thought that the blood of the mother circulates in the fetus, but recognized and carefully described the foramen ovale and the ductus arteriosus and venosus, the existence of which was forgotten for a long time until they were rediscovered and described by Botalli and Aranzi about the middle of the sixteenth century.

Since Galen dissected many domestic animals, he often transferred the observations made upon them directly to man, thereby misleading many who followed him. This need surprise no one and we are daily doing this very thing when we apply, without qualifications, results obtained from experiments on animals to the human being. Because of his devotion to the dissection of animals, it is surprising that Galen does not seem to have studied incubated eggs or human conceptuses, both of which he probably could have obtained easily.

Stanford University.

(To be continued)

UTAH MEDICAL HISTORY: SOME REMINISCENCES*

By BELLE A. GEMMEL, M. D.
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IT became my pleasant pastime during the past winter while browsing through the family papers to segregate those portions in my father's handwriting which pertain to the early history of the medical profession in Utah.

It is not in my power to do justice to those brave souls whose lives were so intimately bound up with the struggles of a pioneer people, and it is quite beyond the scope of this paper to offer more than to refer to a few of the early leaders in medical practice in Utah.

These comments I shall confine to those men who, from 1857 to 1870, were more or less actively associated with my father, Dr. W. F. Anderson, in the practice of medicine in our State of Utah.

It would be impossible to separate the religious from the secular life of the early pioneers of Utah. One might ask what it is that prompts men to leave pleasant surroundings and family ties to seek adventure in far fields. This reaching out for the unknown marks the progress of the human race, be it in the physical universe or in the realm of the mind.

Men and women of the Mormon faith braved the wilderness to settle in a new country. The very dangers and vicissitudes they encountered made them strong and united. The tenets of their religion attracted others in foreign lands, and so we find in this intermountain region a diversified colony of human souls, all more or less united by the common tie of self-preservation. A strong religious belief in a latter-day dispensation was an even greater force in holding them together as a people. It was to this community that my father came in 1857 from California.

* * *

Washington Franklin Anderson.—Washington Franklin Anderson was born in Williamsburg, Virginia, January 6, 1823, the son of Leroy Anderson and Hannah Wright Southgate. His father was a teacher of the Greek and Roman classics and of French and English literature. His early boyhood was passed in Mobile, Alabama, without events of unusual interest. He began his medical education at the University of Virginia in 1841, and finished his course at the University of Maryland in 1844. He was a resident student of the Baltimore Almshouse Hospital during 1842-44, where he had very unusual privileges in dissections, postmortem examinations, and studies in pathology. He practiced his profession in Sumpter County, Alabama, and in Mobile, until the outbreak of the Mexican War in 1846, when he joined the Alabama Regiment and served in the ranks as orderly sergeant of his company.

At the expiration of his service he was honorably discharged. He then removed to Yorktown, Virginia, where he practiced medicine until 1849, when he emigrated to California, arriving by way of Idaho and the Humboldt River at the height of the "Gold Rush." He practiced in Yolo County, California, until 1857. In 1854 he was made Worshipful Master of Yolo Lodge No. 81, Yolo, California, then working under a dispensation from the Grand Lodge of California, and in the following year was duly elected Master of the Chartered Lodge, in which capacity he served until his removal to Utah. He was also elected a magistrate in his township, and acted several years as Justice of the Peace. But these contacts did not seem to allay his longing for the law and order of a more civilized community where he could practice his profession among his peers. In June of 1857 he joined a company of Mormon converts and their leaders to return to the East by way of Salt Lake City; and his diary, written while crossing the Nevada desert, reveals a growing interest in the tenets of the Mormon faith, expounded in sermon and in conversation around the camp fire.

Peregrine Sessions was captain of the company. Joining with Hezekiah Thatcher and family across the Sierra, then with the Carson Company

* A paper read at the 1931 annual session of the Utah State Medical Association, Salt Lake City, September 9 to 10, 1931.

(William Jennings, Robert Sharkey, Cherry, Isaac Hunter, and other families), they traveled through Carson Valley, up the Humboldt River, the Raft River, and down the Malad, arriving in Salt Lake City the middle of August 1857.

In the autumn of 1857 he was appointed surgeon of Colonel Thomas Collister's Regiment, Nauvoo Legion. In 1860, during the administration of Governor Alfred Cummings, he was elected a member of the Utah Legislature from Salt Lake City. In 1868 he was appointed division surgeon of the Utah militia on the staff of Major General Robert T. Burton, under the territorial governorship of Charles Durkee. He held the office of quarantine physician for several years, and was chairman of the Board of Examiners of physicians desiring license to practice. In the early seventies he was elected president of the first medical society in Utah, with Dr. J. F. Hamilton as vice-president, Dr. Heber John Richards as secretary, and with Drs. Joseph and Den. Benedict, Allen Fowler, Williamson, Seymour B. Young, Taggart, and George C. Douglas as fellow members.

On his arrival in Salt Lake City in 1857, my father identified his interests with this community. In a conversation with Brigham Young he made it plain to him that he was not a convert to the so-called "divine" part of Mormonism, but that he admired the law and order that prevailed under his leadership. Brigham Young responded by slapping him familiarly on the shoulder, and assured him that his rights as a citizen would be protected as long as he wished to remain in Utah and practice his profession. This understanding between the two men was a decided influence in establishing a sympathetic attitude both toward the church and toward the people of Utah.

His education and naturally sociable disposition attracted to him men of like character. He was thirty-four years old at this time and lived alone in a small house "one door south of Neibauer's match factory," as his professional card states.

Undoubtedly a close supervision was exercised over all newcomers to Utah in those days. Recognizing this, he wrote to Brigham Young asking permission to continue meetings for recreation and mutual improvement; and in a letter from the President dated November 9, 1861 (now in my possession), this permission was granted. His sociability and gayety of spirit endeared him to young and old alike. He encouraged educational pursuits and became a leader among the young men of the community. The young physician just entering the profession always found a warm heart in my father, who had an instinct for guiding and encouraging the newcomer. By nature a teacher, he was quick to recognize ability; on the other hand, he was prompt to condemn ignorance and charlatanism.

About the year 1869 suit was brought against Doctor Anderson for malpractice, in the sum of $50,000. Major Hempstead was his attorney. The following is a verbatim description of the case:

On the 20th of July, 1867, I received a message to visit Wm. Jenne, of Wanship County, Utah. Found him suffering with a comp. dislocation of the ankle joint with fracture of astragalus, and received the following history of the accident from his friends. The Indians had been committing depredations on the settlements and it was thought best to conciliate them with presents of beef. Young Jenne was called on to ride out to the herd and bring up a steer for the Indians. Jenne rode a wild young horse that bucked and threw him with great force among the rocks, the horse falling on the rider's leg.

Jenne was brought to his residence, not a great distance, by his friends. I saw him about 24 hours after the accident. In surgical parlance, the injury was called a compound comminuted fracture of the ankle joint. The joint was torn asunder, the astragalus, (a short thick bone on which the bones of the leg rest and which forms the lower half of the ankle joint) was broken in half. One-half of the astragalus was hanging to the joint by a portion of the lateral ligament which was entirely ruptured and exposed to the air. There was fracture of the lower end of the fibula, and much contusion and laceration of the muscles and tissue surrounding the joint.

The patient was put under chloroform, the injury thoroughly examined and explained to his friends, who were fully convinced that amputation was necessary. The operation was then performed, and some hours afterwards I left Jenne in good condition and returned home, having given directions to attendants in relation to treatment, until I should see him again. I visited Jenne again on the 26th of July and found everything going favorably with the wound and his general condition good. On the 29th I was informed of his bleeding, but, owing to press of business could not go and sent styptics to stop bleeding. Visited him again on the 31st of July and found the stump sluffing, and mortification extending up above the knee. After consultation with his friends, dispatched a telegram for Drs. Bernhisel and Tait to come out and consult as to amputation at the thigh. Dr. Tait came the same night and after consultation with him I immediately performed amputation at the thigh, Tait assisting. On the next day the patient had rallied somewhat from the shock of the operation, and I returned to the city. Visited Jenne again August 8th, found him doing well and returned to the city. Visited him again August 30th and found there had been a slough at the end of the stump and about three-quarters inch of bone exposed. Saw him October 10th in the city and removed the dead bone, Drs. Bernhisel, Tait, Groves, and H. J. Richards assisting. Visited Jenne daily until October 24th, when the stump had entirely healed.

Argument and Miscellaneous Questions Brought Up in Course of the Trial. . . .

A verdict of *"No cause for action"* was given by the court.

* * *

Two Statements.—The following are copies of two bills rendered in other cases:

Charles Oliphant.....to W. F. Anderson Dr.

Sept. 23.	To reducing dislocation and administering chloroform	$6.00
	To 7 visits thereafter	7.00
		$13.00

Br. Littlefield

1860 To W. F. Anderson M. D. Dr.

To medical advice incl. visit child, etc. $2.00

* * *

The last seventy-five years marks an epoch in the progress of the medical sciences. In the fifties nothing was known of bacteriology nor of the mode of transmission of contagious diseases. Research in public health was then in its infancy. Bedside observation and postmortem dissections formed the basis of clinical and pathologic study.

Physicians were groping for the newer knowledge of bacteriology and the allied sciences to explain the causes of disease. In my father's armamentarium stood bottles of cinchona sulphate, (McKesson and Robbins), brought to Utah in 1857 by Johnson's Army. Calomel, potassium iodid, the salicylates and bromids, tincture ferri chlorid, and the opiates were the *sine qua non* of medical practice. Cardiac and renal dropsy was reduced by large doses of cream of tartar and jalap, with digitalis to control the heart's action. Close bedside study and the personal handling of remedies gave a skill in therapeutics that may well be envied by the physicians of today. The study of family characteristics and traditions, and day and night attendance at the bedside were all in the day's work.

Cases of harelip, fractures, stone in the bladder were frequently met with. The first ovariotomy done in this region was performed by my father in 1882 under the carbolic acid spray, the best antiseptic precaution known in that day, and the patient made a good recovery. Before that time the abdominal cavity was a sealed region not to be invaded by the surgeon's knife. Rheumatism, with cardiac and renal complications, was prevalent; tuberculosis and malaria were introduced from without, though my father records cases of tuberculosis among the local Indians. Sick Indians were taken care of through the Government agencies, though he often treated cases of rheumatism among these people. He kept an articulated skeleton in the back room of his office, and I well remember the terror it inspired in some of these stolid visitors when, waiting their turn for attention, they caught a glimpse of it and heard the rattling of the bones.

"A Plea for a More Exact System of Clinical Observation and Some Advantages of a Record of the Same" is the subject of a paper presented by him at one of the first meetings of the medical society. In this paper he urges physicians to assemble and present bedside records for mutual study. This period seems to be a turning point in the ranks of the medical profession throughout the United States, in the building up of the science of sanitation, and in elevating our profession to a position of dignity and usefulness. Descartes wrote in the eighteenth century, "If it be possible to perfect mankind, the means of perfecting will be found in the medical sciences."

Just here I would call attention to the debt we owe to the engineering profession in maintaining public health today. There were then no restrictions or regulations governing the supply of water and milk. Drainage from farm and domicile was apt to be into the nearest stream, and outbreaks of typhoid, scarlet fever, and diphtheria in its most virulent form were of annual occurrence and were combated with the best means at hand, but the physician was helpless to prevent occurrences of these diseases.

* * *

Two physicians whom my father frequently mentions in these early memoirs were Dr. William France and Dr. John M. Bernhisel. Of the former (William France) very little is known. He had an impediment in his speech, caused by a cleft palate (or perhaps by an injury to his nose). He was not a robust man. He excelled in surgery. The following obituary is copied from the Deseret *News* of March 21, 1860, page 24:

"William France, M. D. Died at his residence in Salt Lake City, Tuesday, March 20th, 1860, at 6 o'clock a. m. . . . "

* * *

John M. Bernhisel.—Doctor Bernhisel's career in Utah is well known. However, my father's tribute to him should certainly find a place in the medical history of Utah, as it is founded on a personal acquaintance and preserves in a marked degree his characteristics and his religious tendencies. He was a gentleman of culture and traditionally a Whig in politics.

He was a member of the original board of regents of the University of Deseret, Orson Spencer being first chancellor.

In his fifty-third year he was elected delegate to Congress from the territory of Utah (1851), reëlected in 1853 and again in 1855.

In 1852 he selected books for the Territorial Library, $5000 having been appropriated for this purpose.

Doctor Bernhisel lived on the northwest corner of North Temple Street in a plain two-story house which somehow resembled the uncompromising personality of its owner. I remember several broad sandstone steps which formed the approach to the front door; the iron knocker whose tones reverberated through the empty hall as on one occasion when I was with my father he struck three well-timed strokes on it, and finally the cautious opening of the door by the old doctor himself, peering at us through his spectacles, for he was very near-sighted. He was clad in dressing gown and carpet slippers and had a book in his hand. Evidently we had disturbed him at his reading, but his face lit up in pleasant recognition and he invited us into one of the large, rather bare rooms of his house.

The ethics of the profession were carefully observed in those days and a consultation between my father and Doctor Bernhisel was an occasion of considerable formality. His remark on leaving the sickroom on one occasion was: "Cultivate, my dear madam, as far as possible, a cheerful, happy and contented disposition, and all will be well"; which became a byword in our family when as children we teased each other in case of illness.

The practice of bleeding had been included in the doctor's medical training and he was an ardent supporter of this method of relieving a patient of his ills. On one occasion, when considerable blood had been taken from the arm of a patient, and my father mildly protested against continuing the procedure further, Doctor Bernhisel interposed "Bleed her to death," meaning, of course, "Bleed her until she faints." Such were the methods of some of those "doctors of the old school."

As I remember him, Doctor Bernhisel was rather a formidable person. On ordinary occasions and for professional visits he wore a long frock coat with stock collar and high silk hat, after the fashion of a doctor of the old school, which indeed he was.

He taught his children Latin, and was a stern disciplinarian. . . .

John Milton Bernhisel was born June 23, 1799, at Lloysville, Perry County, Pennsylvania; was graduated from the University of Pennsylvania April 6, 1827. He moved to Nauvoo in 1842 and died in Salt Lake City on September 28, 1881.

* * *

Medicine, like music, seems to be a family tradition and this history of early pioneer physicians in Utah would be incomplete without mention of the Richards family.

Education and close application to scientific principles are the important factors that rescue the healing art from the hands of charlatans and impostors. The history of the Richards family in Utah is one of brilliant success in the field of medicine; may a more facile pen than mine make the record of their notable achievements in the profession.

Appended below is the obituary of H. J. Richards, which gives the outline of his life and work:

Dr. Heber John Richards.—Born in Manchester, England, October 12, 1840. Parents, Dr. Willard Richards and Jennetta Richards. Father married while on a mission to England. Mother died in Nauvoo when Heber John was four years of age.

In 1848 he came to Utah with his father and the pioneers. His life was one of hardship. When but fourteen years old his father died.

Married Mary Julia Johnson April, 1862. Left for a mission to England April 30, 1863. Away three years, traveling in Europe one summer. Returned in April 1866.

November 10, 1867, left Salt Lake City for New York, being sent by Brigham Young to study surgery and carrying a letter of introduction from President Young to Dr. Lewis A. Sayer. Attended Bellevue Hospital Medical College 1867-68, 1868-69. Left New York in April 1869, arriving home in May. He was associated with, and studied under, Dr. W. F. Anderson until November, then went into the Co-operative Drug Store to study medicine and assist. Returned to New York August 1870, studying there until March 1871.

From the early Church records the following is gleaned:

Willard Richards (the father of Dr. Heber John Richards), sixth son of Joseph and Rhoda, was born in Hopkinton, Middlesex County, Massachusetts, June 24, 1804. He devoted his leisure time to the acquisition of knowledge.

In February 1827 he began lecturing on electricity and other scientific subjects throughout the New England States. For several years he devoted much time to the study of the Healing Art and delivered many instructive lectures on that subject.

In 1834 he entered the Thompsonian Infirmary in Boston and practiced under the direction and instruction of Dr. Samuel Thompson. In 1835, at the request of Mr. Albert P. Rockwood, he went to Holliston, Mass., and delivered lectures on the Botanic or Thompsonian practice of medicine, which created much excitement there and in the surrounding towns.

He removed to Holliston and practiced with success for one year, during which time he resided with Mr. Rockwood.

4476 Hortensia Street.

CLINICAL NOTES AND CASE REPORTS

CHANCRE OF FEMALE MEATUS

WITH TOTAL OCCLUSION AND NEOARSPHENAMIN STOMATITIS

REPORT OF CASE

By HERMAN FEINBERG, M. D.
San Francisco

IN presenting this case report it may be stated that it is very interesting and rare to observe an occlusion of the meatus due to a chancre and producing a retention of urine. The stomatitis following the use of neoarsphenamin is also an unusual complication.

REPORT OF CASE

A. E., a white female, age twenty-five, on June 3 complained of "knots" in both inguinal regions and dysuria. A careful history found the patient also suffering from occipital headaches and general malaise. The patient complained of these symptoms four days previous to her visit to my office.

Chancre of the Meatus.—Pelvic examination failed to reveal a lesion or inflammatory condition of the meatus, labia, fourchette, clitoris, vagina, or cervix, but there was a marked bilateral inguinal adenopathy. Smears were negative for gonorrhea. The Wassermann test (Kolmer and Craig) was negative and so was the urine. It was not possible to determine the etiologic factor producing the inguinal adenopathy, but from the above history the case was diagnosed as lues.

The patient was asked to return in five days for another Wassermann. She left town and returned on June 10 (eight days later) with a typical chancre of the meatus. While out of town the patient had to be catheterized because she had been unable to void for eighteen hours. The doctor she visited had to pass a sound and then a catheter in order to remove the urine. The same procedure had to be instituted by me to relieve her of the retention of urine. Some resistance was encountered in passing a 15-F sound through the central necrotic area of the chancre in order to enter the urethra, and then a glass catheter was inserted.

The chancre, which was markedly indurated and about the size of a penny, covered the meatal lips completely. There was a distinct and marked eversion of the urethral orifice, giving the effect of a rolled border. A darkfield examination revealed numerous *Spirocheta pallida*. The Wassermann taken at this time was four plus.

Neoarsphenamin Stomatitis.—The neoarsphenamin stomatitis deserves a few lines of discussion, as it is an unusual complication. Antiluetic treatment was administered the following day. On June 11 the patient received .45 gram neoarsphenamin intravenously. On June 13 the patient telephoned complaining of a burning, sore throat, and that she had expectorated two pieces of "black meat" which upon examination proved to be pieces of exfoliated necrotic mucosa of the hard palate. The lips, gums and pharynx were dry, hot, and markedly hyperemic, particularly the lips and gums. The lips were involved more than the gums, palate or pharynx, as they were cracked, scaly, itchy and burning. There was no general reaction. Sodium thiosulphate to the amount of .75 gram was administered intravenously and the patient noticed an improvement in her condition the following day. Another .75 gram was given on the third day. Two days later the entire mouth was normal. Citrocarbonate, Dobell's solution for a gargle, and four per cent mercurochrome as a throat swab had also been used. Neoarsphenamin was discontinued in favor of bismarsen, which the patient is receiving two-tenths gram intramuscularly twice weekly without any local or general reactions in evidence.

Stokes[1] states: "The stomatitis of mercury differs from the neoarsphenamin stomatitis in being moist, fetid, gray, membranous, and spongy. The stomatitis, associated with arsphenamin, may appear alone, in association with aplastic anemia and purpura, or with a generalized exfoliative dermatitis. The association of stomatitis with aplastic anemia following neoarsphenamin seems to be more than coincidental and to constitute a definite toxic syndrome."

In conclusion I wish to stress the point that when an inguinal adenopathy cannot be accounted for, endoscopy should be done, as evidently this particular case had a minute chancre at the urethral orifice which was the cause of the dysuria and inguinal adenopathy.

453 Flood Building.

REFERENCE

1. Stokes: Modern Clinical Syphilology, p. 309. Saunders. 1928.

STRANGULATED DIAPHRAGMATIC HERNIA IN AN INFANT

By HENRY JOHNSON, M. D.
AND
ALBERT G. BOWER, M. D.
Glendale

THE patient was a strong, apparently normal, full-term infant, born at two o'clock in the morning, of a primiparous mother by version and extraction without unusual difficulty. The nurse in charge of the infant noted immediately that when the child was placed in its crib it became somewhat dyspneic and cyanotic. When picked up and held nearly upright, these symptoms disappeared only to reappear when it was replaced in its crib.

A careful physical examination disclosed no heart lesion or other pathological condition that would account for this behavior, so it was decided to wait a few hours to see what occurred. On the morning of the following day it was decided to x-ray the chest in order to rule out any enlarged thymus. These pictures disclosed a moderately enlarged thymus, and also some

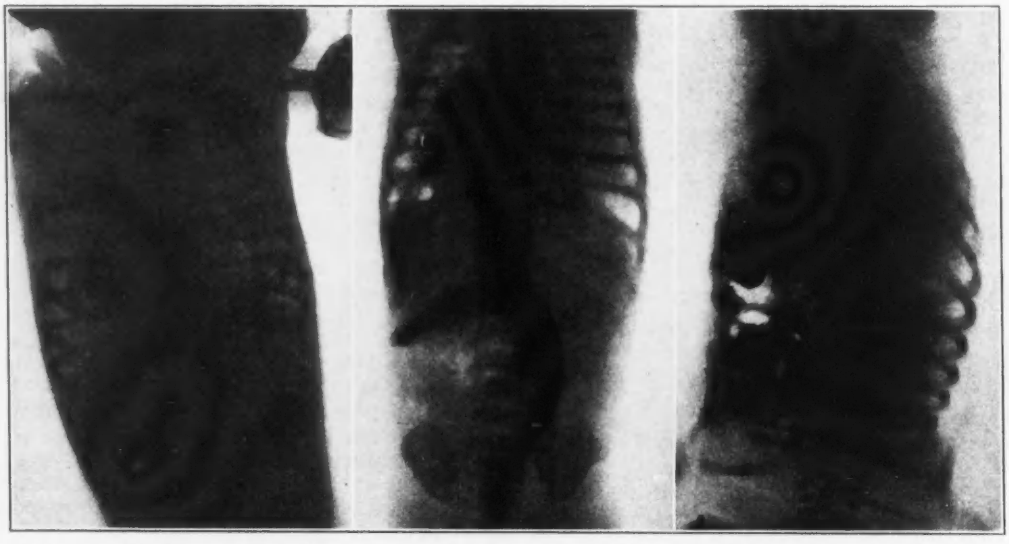

Fig. 1.—Flat plate with intestinal gas marking left side of thorax.

Fig. 2.—Catheter used to give barium enema, showing colon in pleural cavity.

Fig. 3.—Barium test-meal, showing intestines in left thoracic cavity.

strange and unusual markings in the left thorax, suggestive of the appearance of gas. A barium enema corroborated this.

Accordingly a tube was introduced through the nostril into the stomach, and a few ounces of barium milk were given by lavage. In due time pictures were taken and the results were startling. All of the small intestines, with the exception of a small portion of the duodenum, as well as the ascending and a portion of the transverse colon, were found to lie in the left pleural cavity.

It was decided to operate, and forty-one and a half hours after birth, the child was placed on the table. The surgery was performed by Dr. Henry Johnson, assisted by Dr. Raymond T. Wayland. Under ether anesthesia a high abdominal incision was made and the hernial opening located in the lower surface of the dome of the diaphragm. A fair-sized rubber drainage tube was introduced along the bowel through this opening into the left pleural cavity to admit air as the bowels were delivered. Gentle traction made on the colon failed to deliver the bowel. Before it was released into the abdomen sufficient force had to be exerted to tear the bowel loose from the pleura and lung to which it had been firmly adherent. The colon was strangulated, but fortunately color returned before the operation was completed and no resection was necessary. A portion of the mesentery and omentum were also adherent in the pleural cavity. Again, fortunately, hemorrhage was not excessive. The edges of the rent in the diaphragm were freshened and closed with chromic gut. The abdominal opening was closed in the usual manner, sealed with collodion, and hot Epsom salt compresses applied to the abdomen.

The baby was put to the breast four hours after operation had been performed, and every four hours thereafter. After the first two feedings, coffee-ground vomitus occurred, but from that time forth both its feeding and convalescence progressed in an uneventful manner. The child has developed as a normal healthy infant, now weighing twenty-six pounds at the age of nine months, and has never had a day of illness.

136 North Central Avenue.

PSEUDOMEMBRANOUS ANGINA: DUE TO PNEUMOCOCCUS

REPORT OF CASE

By F. M. SPRAGUE, M. D.
Fresno

SOME recent reports in the medical literature, either again or originally, have called attention to the fact that the pneumococcus must be considered among the infectious agents in anginal disturbances that exhibit a pronounced pseudomembrane on tonsil and throat tissues.

This following case is reported not only for its rarity and importance from the early diagnosis and treatment viewpoint, but also because it resembled a typical lobar pneumonia; that is, as to onset, course, duration, termination by crisis with profuse perspiration and rapid recovery, with negative findings (clinically) in the lower air passages throughout the febrile and convalescent periods.

REPORT OF CASE

Patient.—Lorraine F.; age six years; school girl.

Chief Complaint.—Sore throat of sudden onset thirty-six hours previously; high temperature (102-105 Fahrenheit); dysphagia; and marked, painful unilateral adenitis.

Personal History.—Negative, except for an attack of tonsillitis about one year ago. Has had some mild upper respiratory infection, with cough, for past two weeks. There were occasional cases of diphtheria among school children in the city at this time, but no known exposure of patient.

Physical Examination.—Positive findings were limited to a swollen left tonsil, studded with infected follicles, and accompanied by a moderately inflamed throat and a pronounced cervical adenitis of same side. Clinically, the lung areas were negative, and so remained at all times the patient was under observation. Throat culture: (twelve-hour) negative for diphtheria bacilli. Growth showed pneumococci and streptococci, with the former predominating.

Progress.—High temperature continued and on third day of illness the follicular tonsil exudate became confluent; then rapidly assumed a pseudomembranous type and extended well over soft palate and onto the opposite tonsil, with added right cervical adenitis. Diphtheria antitoxin, ten thousand units, was given intramuscularly, with some clinical relief of symptoms in twelve hours, but with no apparent effect upon the membrane or temperature. Throat culture, direct from membrane, again negative for Klebs-Löffler bacilli, but grew a pure culture of pneumococci, the type not determined. On the fifth day of illness the fever ended by crisis, with accompanying profuse perspiration, and the local lesions began to clear rapidly; and within twenty-four hours after the crisis persuasion was necessary to keep the little patient at rest in bed.

Early Marriages in New York.—An analysis of the marriage records of the State outside of New York City for 1930 shows that in 230 marriages the bride was under 16 years: 33 brides were 14, and 197 brides 15 years of age. The distribution of the ages of the grooms whom these girls married was as follows: under 20 years, 46; 20-24, 132; 25-29, 32; 30-34, 13; 35 years and over, 7. The youngest groom was 16, the oldest 51 years of age. The median age of the grooms of the 14-year-old brides was 22.8 years; of the 15-year-old brides, 21.3; and for the combined ages, 21.5 years.

The assertion is often made that child marriages are largely confined to that section of our population which is of foreign birth or of immediate foreign origin. The figures, however, do not support this statement. Of the 230 brides, 10 were foreign-born: 5 natives of Italy and 5 of Canada. Of the 220 native-born brides, 153 were of native parentage, 12 of mixed parentage, and 55 of foreign parentage. Relating these numbers to all marriages in the several nativity groups, it is found that they represented 6 in 1000 of the native-born brides of native parentage, the same proportion in the group of native-born brides of foreign parentage, while among native-born of mixed parentage only two brides in one thousand were 14 or 15 years old.

Among the grooms, 47 were foreign-born: 23 were natives of Italy; 6 of Canada; the remaining, natives of twelve different countries. The native-born grooms were divided according to parentage as follows: native, 129; mixed 23, foreign, 31.—*Health News.*

Be prompt at your appointment; that is always possible. Many are always late at a consultation; few miss a train. There is no excuse for tardiness.—Osler, the Teacher.

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An Open Forum for brief discussions of the workaday problems of the bedside doctor. Suggestions of subjects for discussion invited.

THE TREATMENT OF HEAD INJURIES

On General Treatment

HOWARD W. FLEMING, M. D. (384 Post Street, San Francisco).—From a therapeutic point of view, head injuries may be divided into three classes. Fortunately the majority of such patients in one group recover satisfactorily without radical treatment. A second group consists of patients who have suffered such serious brain damage that therapeutic efforts are futile. In addition to the above, there is a third group of patients for whom the therapy instituted largely determines the prognosis.

Intelligent treatment is predicated on a knowledge of the existing disorder. Increased intracranial pressure is the most frequent complication in borderline cases; it must be diagnosed early and treated correctly. In head injuries, increased intracranial pressure is caused by an excess of free or fixed fluid. Bleeding may occur into the ventricles, into the brain substance, or into the intradural spaces; or it may be extradural. Cerebrospinal fluid, misplaced or in abnormal amount, may cause such pressure that surgical intervention is indicated. Naffziger directed attention to those patients in whom rents in the arachnoidal membranes allowed fluid to collect in the extra-arachnoidal spaces. Here it is not absorbed and may accumulate in large amounts, causing great pressure.

Fixed fluid in the brain substance itself usually is referred to as cerebral edema. All tissue, and especially brain substance, will absorb fluids when deprived of oxygen. Trauma causing contusion of the brain impairs the normal blood supply and venous return.

An early recognition of increasing intracranial pressure is essential. The same careful observation given the patient who is thought to have an acute abdominal condition is even more necessary in critical head injuries. Undue procrastination frequently sacrifices the opportunity for relief of pressure, and prevents recovery. Increasing stupor, secondary loss of consciousness, onset or increase of paresis, slowing of the pulse and respiration, increase of blood pressure or, more particularly, increase of the pulse pressure, are danger signals.

Spinal puncture is an excellent diagnostic and therapeutic measure. There is some risk, but in experienced hands I feel that the risk of this procedure is far outweighed by its advantages. It is within the realm of possibility that, in a patient with high intracranial pressure, a herniation through the foramen magnum may result from spinal puncture. This is a real danger in cases of chronic intracranial pressure and particularly in those associated with an internal hydrocephalus caused by a lesion in the posterior fossa.

Spinal puncture gives fairly accurate information regarding the degree of intracranial pressure and a manometer reading always should be made. The color of the fluid is some index of the amount of bleeding. Cell count and Wassermann tests may explain unusual complications.

A single spinal puncture, or repeated punctures, may tide a patient over the period of increased intracranial pressure. This is true in those patients in whom there is an excess of free fluid. If, however, the patient does not show a very definite improvement following each spinal puncture, other methods of therapy should be tried.

The pressure resulting from cerebral edema is best relieved by other than surgical methods. Magnesium sulphate by mouth or rectum, and hypertonic glucose or salt solution intravenously give good results. Repeated injections of glucose solution solve the problem of nourishment as well.

Signs of continued or increasing intracranial pressure, in spite of the therapy suggested above, indicate the advisability of operation. Procrastination beyond the period of compensation will sacrifice almost every chance of recovery. Pressure symptoms, superseded by rapid pulse and falling blood pressure, signal the onset of decompensation.

When the problem is one of intracranial pressure and unrelieved by simpler measures, subtemporal decompression is then in order. Selection of the side must be determined by the summation of the clinical evidence. The visible evidence of injury and x ray findings should not outweigh positive neurological signs. The right side is selected unless definite findings suggest the left. Great care is necessary to avoid contusion of the brain in areas that may increase a patient's permanent disability. Only too frequently openings are made high in the parietal area rather than low in the temporal region, with resultant paresis and epilepsy.

Extensive removal of bone is usually neither necessary nor advisable. The chief concern is to arrest bleeding and effect adequate drainage of free fluid. A rubber dam drain left beneath the temporal lobe for forty-eight hours frequently will give satisfactory relief of pressure in amenable cases.

Operation is indicated for those patients with compound or simple depressed fractures of the skull if seen early and if the patient is not in

shock. Surgical care should not be attempted unless proper facilities are available to debride the wound and repair the dura. Novocain locally usually provides adequate anesthesia.

A frequent complication in those cases with fracture through the base of the skull, opening middle ears or sinuses, is meningitis. Attempts to sterilize external cavities by irrigation with antiseptic solutions frequently defeat their purpose. Only too frequently contaminated substances are washed into the intradural spaces. Dry, sterile cotton, plugged lightly into the ears, is usually all the care necessary. When sinuses have been opened, every effort should be made to keep the nares open, and promote drainage. Sneezing, coughing, and efforts that increase intrasinus pressure should be guarded against.

Many surgeons feel that, in patients in whom there is evidence of communication between intradural spaces and frontal sinuses, it is advisable to place a drain between dura and bone as a prophylactic measure. Certainly after the onset of meningitis, it is proper to attempt to drain the local focus as a therapeutic measure.

The problems incident to the care of head injuries are too numerous to permit anything more than their suggestion in a discussion such as this. It is imperative, however, that we be alert to recognize those symptoms and signs of disordered function that may be influenced by proper care.

* * *

On Treatment of the Ophthalmologic Complications

Frederick C. Cordes, M. D. (Fitzhugh Building, San Francisco).—Many of the ophthalmological complications of head injuries, such as choked disk and the various fractures about the orbit, are an intimate part of the general picture and their treatment belongs to the neurosurgeon. There are, however, certain conditions that require ophthalmologic consideration and therapy.

The ocular complications of head injuries, according to Roemer, can be divided into six main groups: (1) hemorrhage into the orbit and exophthalmos; (2) emphysema of the orbit; (3) fractures of the bones of the orbit in connection with fractures of the base of the skull; (4) lesions of the optic nerve in connection with fractures of the base of the skull; (5) lesions of the central optic tract; (6) paresis of the ocular muscles.

Orbital hemorrhages and exophthalmos frequently follow severe contusions to the bones of the face and skull. The bleeding may come from lacerated vessels in the orbit or from fractures in the orbital wall. This blood at times forces its way into the orbital fat, Tenon's capsule, into the vaginal space of the optic nerve or beneath the periosteum of the bones. These hemorrhages also occur in fractures of the base of the skull. In fact, in many cases this finding is diagnostic of basal fractures. The hemorrhage produces discoloration or ecchymosis of the lids except where the blood is confined beneath the periosteum. The exophthalmos is usually immediately present and is accompanied by limitation of motion. If the proptosis is marked, it can prevent the closure of the lids and expose the cornea to the danger of keratitis lagophthalmos. Vision may be impaired, or even lost, if the hemorrhage is so great as to exert pressure on the optic nerve or the ophthalmic vessels.

Treatment in orbital hemorrhages depends somewhat upon the severity of the condition. As a rule, the blood undergoes spontaneous resorption. In subperiosteal hemorrhage, the absorption may be greatly prolonged. In such cases a pressure bandage is indicated. In the immediate stages continuous ice compresses may help control the bleeding, while later, heat encourages its absorption. In recent injuries accompanied by extreme exophthalmos, where lagophthalmos endangers the eye, incisions or puncture have been recommended to evacuate the blood.

There are three types of emphysema of the orbit; the purely palpebral, the orbitopalpebral, and the orbital. The palpebral *per se* is a rare condition seen in fractures of the lachrymal or nasal bones. The orbital or orbitopalpebral is much more common. Air enters through fractures of the lamina papyracea and is confined behind the septum orbitale, producing an orbial emphysema.

Should a portion penetrate beneath the skin the orbitopalpebral type is produced. The lids are swollen in all three types, but exophthalmos is present only in the orbital type. Besides swelling, we have typical findings of air crepitation to palpation. An emphysema always means a fracture of the orbital wall as it occurs only when a communication has been established between the orbit and the nose or its accessory sinuses.

The course of orbital emphysema is usually benign. The only treatment indicated is a pressure bandage and the avoidance of any act, such as blowing the nose, that might cause increased air pressure within the nasal cavity. With a pressure bandage, the emphysema, as a rule, disappears within a few days.

Fractures of the upper wall of the orbit are found in association with those of the frontal bone and the base of the skull. The supra-orbital nerve is occasionally injured in fracture of the upper orbital margin. Fissures of the roof of the orbit frequently extend into the optic foramen. Fractures of the lower margin of the orbit may injure the lachrymal apparatus. Blows on the lower orbital rim may fracture the maxilla or zygoma and extend to the floor of the orbit so that the orbital contents lose their support.

The treatment of these fractures is surgical and depends upon the nature of the injury. In one such patient who was referred to Dr. Howard Fleming, it was possible to replace the fractured lower orbital rim and floor by working through the antrum.

Traumatic exophthalmos is well known and follows violent contusion on the bony margin of the orbit or its immediate neighborhood. Such blows may fall on the nose, forehead, malar bone, cheek, or the side of the head. The characteristic result is that the eyeball recedes into the orbit, giving the appearance of an artificial eye. As a rule the margin of the orbit is deformed with scars in the surrounding skin. The factors combining to produce this condition are enlargement of the space within the orbit caused by the separation of the fragments of bone, displacement of orbital fat through a gaping wound into one of the accessory sinuses or by a pressure atrophy. The deformity is permanent and treatment is of no avail. If the patient is troubled by diplopia, it may be necessary to cover the one eye by a shield or patch.

The principal damage to the optic nerve in head injuries results from fractures of the optic canal. These frequently follow blows on the frontal bone. The outstanding symptom is loss of vision, and this reduction is usually regarded as due to a fracture of the bony canal with hemorrhage into the sheath or to actual laceration, or even severance of the nerve itself. Pressure from the anterior clinoid may also produce the condition. Field defects are not typical in these cases, but a section defect extending into the macula is almost pathognomonic.

If the optic nerve has been torn across, direct and consensual pupillary reaction are absent. If the symptoms are due to pressure of blood, the pupillary reactions return as absorption occurs.

There have been no reports of the treatment of these cases. O. and H. Barkan,* in a fairly recent paper, state that the Kronlein operation has been advised to remove splinters of bone and relieve the pressure from hemorrhage. They also report a suggestion from Doctor Naffziger, "that the best method of approach would be a subdural one, as for pituitary tumor, looking for a fracture of the roof of the orbit on the way. This would enable one either to approach the anterior clinoid or proceed through the roof of the orbit to the optic nerve and foramen, as the case might be."

In addition to the primary injuries to the optic nerve, secondary atrophy may follow choked disks, complicating head injuries.

All portions in the course of the optic fibers may be affected in cases of cranial injury. The perimetric fields often give valuable information as to the site of the lesion. Treatment is of no avail in direct trauma to the pathway. If due to hemorrhage, some return of function may follow absorption. The use of potassium iodid has been recommended as a possible aid.

Nerves supplying the ocular muscles may be traumatized in head injuries. The abducens, as is well known, is the most frequently involved due to its long course along the base of the skull. Occasionally associated with these are injuries to the facial nerve. The oculomotor is rarely involved in skull injuries.

Therapeutically, little can be done in these cases. A troublesome diplopia can be relieved if present by covering the affected eye with a shield or ground glass.

Potassium iodid, in gradually augmented doses, may be useful. The faradic or interrupted galvanic current has been recommended in these lesions. The negative pole is placed, daily, over the closed eyelids for five minutes at a time. This should be continued as long as any improvement is apparent. Where improvement takes place it often proceeds so slowly that a year lapses before the maximum recovery has taken place.

Where a permanent paresis or paralysis of the sixth remains, the condition can be greatly improved cosmetically and functionally by surgery. The outer halves of the superior and inferior recti muscles are transplanted into the insertion of the externus. Following this the eyes will be straight in the primary position, but the abduction will naturally be limited.

There is no treatment for permanent involvement of the third nerve excepting in an isolated lesion of the levator palpebrae. In this condition one of the various ptosis operations may be recommended.

* * *

On Plastic Surgery in Head Injuries

W. S. KISKADDEN, M. D. (1930 Wilshire Boulevard, Los Angeles).—The average physician is not prone to think of head injuries in any terms other than those of fracture and concussion. However, damage to the face, either from lacerations or fractures, may be considered a prominent subdivision of our subject, as is attested by the importance placed upon such facial injuries by laymen and the many high awards from sympathetic juries.

The plastic surgeon often contacts these patients either on their way to court for settlement or on their return therefrom. Examination will often disclose scars which are so slight that we can safely prognosticate a complete fading and disappearance within one or two years' time. But rather too often we find a wide hypertrophied or even keloidal scar, the edges of which are either inverted or everted and lined and crossed with stitch marks. If, for instance, the scar be around the mouth, we may find the mucous membrane pulled into the scar and the mouth distorted. Again, the eyebrow may be no longer a smooth and graceful curve, but have, on the contrary, an unpleasant break or hump in the curve, due to haphazard and careless suturing. Glass and other foreign material from the street will often be buried under the skin. Nor is the disfigurement always limited to lacerations, for frequently unrecognized or unreduced fractures of the nose, malar region, zygoma, or orbit will further mar the features.

* Barkan, O. and H.: Fracture of Optic Canal, Am. J. Ophth., 11:767-774 (Oct.), 1928.

The responsibility for all end results rests entirely with the surgeon rendering first aid. When facial injury is complicated with possible brain injury, it is perfectly right that the less important facial repair give way to treatment for skull damage. But all too often the opportunity of properly treating lacerations is neglected or done quickly, hurriedly, or poorly. Experience led Kanavel to state that finger and hand infections should be opened under general anesthesia. By the same token, may I venture a similar observation, that all lacerations should be repaired as soon as possible in a clean, properly equipped surgery or minor surgical dressing room. The reasons for this should be obvious.

The factor of time is important. The earlier a wound is seen and dressed the less opportunity for infection to occur. Space does not permit entering into all the measures used in sterilizing a wound and rendering it clean and ready for suture, but all of us have established some routine. I do feel that the indiscriminate use about the face of United States Pharmacopeia or seven per cent tincture of iodin, or, as it so often happens, an even stronger solution, is to be condemned. The skin of the face may be blistered, the fat and subcutaneous tissue may be chemically traumatized, and with this as a basis it is not wondered at why a clean, sharp cut, even carefully sutured, frequently becomes infected. On the contrary, if a mild two to three and one-half per cent solution of iodin be used, the bleeding stopped by pressure or fine tying, dead spaces eliminated, and accurate and careful apposition of the skin edges carried out, nearly any wound will heal *per primum*. Abroad it is often customary to compress and Dakenize severe lacerations for twenty-four hours and then attempt the repair. I cannot agree upon this as a routine measure, and feel that such a delay increases the danger of infection. However, with infection present, hot compresses of normal saline or boric acid should be immediately instituted, adequate drainage provided, with possibly the removal of part, or all the sutures. Delay in recognizing infection and initiating compresses tends only to allow the infection to extend, with the loss of valuable tissue.

With severe lacerations of the face one can hope to gain good scars only by thoroughly cleansing the wound of foreign material and then closing the wound with accurate and careful sutures of fine horse hair mounted on fine needles. Catgut should not be buried. If deep tissue approximation is desired, a silkworm may be tied somewhat loosely over gauze, after encircling the structures which need apposition. This suture should be removed in from twelve to thirty-six hours. Should the tissues be shredded and abraised, debridement is indicated, but if this threatens to be extensive it is wiser to conserve tissue for a subsequent repair. Where abrasions of the face contain foreign matter which is literally ground into the skin, tannic acid as used in burns may be employed. I have had no opportunity of using or observing the procedure, but it is logical.

Fractures are often hidden by swelling and, therefore, careful examination is necessary. Displaced nasal bones or a dislocated septum may be reduced with a long curved hemostat and are easily replaced during the first few days. A large towel clip, if used early, will often give sufficient traction to reduce a fractured zygoma or malar bone. Local anesthesia is necessary for adequate reduction. I have found the easiest means of detecting fractures of the malar bones, orbital region, and zygoma, is in palpating the region while standing behind and above the patient's head and looking down at the transverse profile. Fractures in this region usually maintain their position following early reduction, but may require the use of a Kingsley splint if severe or bilateral.

Late treatment of facial scars consists in their excision and the careful approximation of the skin edges. At this time, hollowing or dimpling, due to muscle retraction, previous infection or adhesions, must be corrected by subcutaneous flaps of tissue, with wide undercutting. The skin edges should be also undercut so that they may be brought together without tension. Foreign material, such as glass, is removed by excision. If it has been ground in the skin from an abrasion, it may be removed by partial excision. I have not been entirely successful in tattooing it out, and feel that the plan of partial excision offers a better result. If it is superficial the repeated use of acid in the form of carbolic, or better, trichloracetic may be of value. Carbon dioxid snow is also worthy of trial. It should be remembered that over a period of time such a scar tends to fade and entirely disappear by gradual absorption of the buried foreign matter.

All stitches are removed early and scrupulous care to avoid crusts is maintained. Later the scar may be improved by massage, application of small fractional doses of x-ray, and cauterization with trichloracetic acid. Time and nature, coupled with massage, may be counted upon to immensely improve any scar, and one should encourage a patient to wait at least twelve months before judging the end result.

The late treatment for facial fractures is difficult and should not be lightly undertaken. Complete mobilization of all bones is necessary. The correction of old fractured nasal bones frequently demands release of skin, mucous membrane, septal attachments, with often the complete mobilization of the septum. Malar fractures and those of the zygoma may be treated intra-orally or by leverage through an incision made in the hair line over the temporal muscle, after the method of Gillies. By inserting a screw through a tiny incision and penetrating the bone, adequate traction for reduction is often possible.

The difficulty, however, which is frequently experienced in the late treatment of fractures, especially those about the nose, brings again to mind the necessity and advantage of early, adequate, and thorough first-aid care.

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EDITORIALS*

HAPPY NEW YEAR

In these troublous times, when physicians are more than ever seemingly called upon to be "charity physicians," the presentation of the Greetings of the Season may seem almost an empty gesture. Nevertheless, CALIFORNIA AND WESTERN MEDICINE does extend its good wishes for A Happy and Prosperous New Year to each of its readers.

These are days when an unusual number of worries are coming to many physicians. The days, however, will pass the more rapidly and advantageously if well filled, not only with regular tasks and responsibilities, but with accessory professional activities. For those who, for the nonce, have greater leisure than in the rush days of several years ago, an interest in the work of organized medicine is recommended. There are few activities that can add so much satisfaction to the joy of living, as can be made to accrue through a happy interest in the individual and group activities of one's professional life work. In California many serious problems confront the medical profession. The greater the number of members of the California Medical Association who give attention and thought to the solution of those problems, the greater will be the assurance of progress for ourselves and our successors in the days to come. Your coöperation is invited.

And once again—A HAPPY AND PROSPEROUS NEW YEAR from CALIFORNIA AND WESTERN MEDICINE.

PUBLIC HEALTH EXPENDITURES—PROPOSED CONSOLIDATION OF LOS ANGELES CITY AND COUNTY HEALTH DEPARTMENTS

Tax-Moneys, Even in Public Health Work, Should Be Conserved.—The protection of the public health necessitates the expenditure of large amounts of public funds. Because public funds should be held inviolate and conserved as much as possible, it follows that in even so worthy a cause as that of the public health, the moneys spent should be so used that wastage—whether from abortive efforts or overlapping methods—be held to a minimum.

* * *

Some Interesting Financial Reports on Public Health Work.—On the desk of the editor are several recent reports of public health organizations. It is unfortunate that all licensed practitioners cannot have copies of these reports, because they present a wide range of information, interesting and important to both the medical profession and the lay public.

From several of these annual summaries the financial figures given below have been taken.

* * *

The Rockefeller Foundation.—The Rockefeller Foundation of New York states that during the fiscal year 1930, a total of $2,233,311.89 was expended on public health and allied work. That foundation, since its organization in the year 1913, has expended a total of $42,435,856.94 on such work. Fortunately for the world, the Rockefeller Foundation, in its capital or reserve funds, still has at its disposal a grand total of $214,993,367.42 to carry on work in the future.

* * *

The Pasadena Health Department.—The city of Pasadena has a population of 76,210. The chief of its health department is J. D. Dunshee, M. D. In a volume of some eighty-five pages, Dr. Dunshee has given an excellent presentation of the work of his department for the fiscal year ending June 30, 1931. It is stated therein that the total budget appropriation of the Pasadena Health Department for the last fiscal year was $61,292.45 (a per capita expense of $0.80).

* * *

The Los Angeles County General Hospital.—The report of the Los Angeles County General Hospital for the fiscal year ending June 30, 1931, as submitted by its then superintendent, N. N. Wood, M. D., showed the total expenditures for the year to be $5,395,251.46. Of that amount the sum of $1,167,284.05 was for capital outlays, leaving for in-patient or bed service the sum of $3,734,663.73 and for out-patient or ambulatory patients who went to the hospital, the sum of

* Editorials on subjects of scientific and clinical interest, contributed by members of the California Medical Association, are printed in the Medicine Today column, which follows.

$457,519.26. The cost of care per in-patient per day in this large public hospital was $5.30, and the cost per out-patient visit was $1.24.

* * *

The Health Department of the County of Los Angeles.—The Health Department of the county of Los Angeles is one of the largest county health departments in America. The last fiscal year report of J. L. Pomeroy, M. D., county health officer, covers some 203 pages. In that report Doctor Pomeroy states:

. . . . . "From a total population of 107,613 in 1915 at the beginning of my incumbency in office, the population of the county of Los Angeles has increased to 705,984 (an increase of 700 per cent). We have taken over and organized the health departments of thirty-five cities in the county, some of them with 50,000 to 65,000 population, trained the personnel, planned, built and equipped Health Centers, and created the organization to function over some 4000 square miles. This organization has functioned not only for the public health needs of the ordinary type, but also for clinics for the indigent sick, for school health work, for emergency hospital care, as well as coördination of general social welfare of the district."

The money which was required to maintain these Los Angeles County Health Department activities during the last fiscal year totaled $1,227,791.87.

* * *

The Health Department of the City of Los Angeles.—The current fiscal year's report of the Health Department of the city of Los Angeles has not been printed, but on January 1, 1930, the population of Los Angeles city was estimated at 1,221,653. The provision in the city budget for public health work for the fiscal year was $708,558.74, but fees collected by the department during the year totaled about $117,000, the difference or $591,558.74 representing the funds received from taxation sources.

* * *

On a Proposed Consolidation of the Health Departments of the City and County of Los Angeles.—The largeness of the foregoing figures is no doubt more or less of a revelation to many members of the medical profession. It may also be taken for granted that they will surprise many lay persons.

At the beginning of these remarks it was stated that in the expenditure of public funds, even in so commendable a civic function as that of public health conservation, it was important that no unnecessary wastage of public moneys should take place. It is therefore of pertinent interest to all citizens that financial savings be instituted, provided that such do not lower the standards of efficient service. This is particularly so at this time when economic depression seems to be almost world-wide, and when taxation assessments loom large in the public mind.

For some years, plans of consolidation of the health departments of the City and County of Los Angeles have been discussed in the lay press and at this time, particularly, the consideration of proposed plans should be of interest to both medical and laymen taxpayers.

Without attempting to affirm the merits thereof, the following paragraphs are here reprinted from page 69 of Los Angeles County Health Officer Pomeroy's report. The quotation deals with the possibility of effecting a saving of one to two hundred thousand dollars annually by consolidation and coördination of public health work between the County of Los Angeles and the City of Los Angeles. The excerpts are as follows:

"During the last year the cities of Long Beach and Los Angeles both had under consideration merging their health work with the county. In both cases marked economies could have been effected, but owing to various political reasons the merger was not effected. Both Long Beach and Los Angeles maintain milk inspection at considerable cost to themselves, although the dairies are located in county territory outside the cities in question. Laboratory work as well as field inspection is duplicated. In spite of strong demand from prominent dairy interests and the County Farm Bureau the Los Angeles City Health Officer opposed the creation of a county milk commission to effect economies in milk inspection.

"It was proposed to create a commission on which each of the large health departments would have representation, and to pool all finances and interests. The state law permits such consolidation of interests. Such an organization would have saved the taxpayers $50,000 annually. Both Long Beach and Pasadena representatives agreed to such a proposal, but political interests of the city of Los Angeles defeated the measure.

"It would be possible to consolidate the health work of the city of Los Angeles and the county and save the taxpayers $150,000 to $200,000 annually, together with a great increase in efficiency." . . . .

* * *

Further Studies of Consolidation Plans Indicated.—If the statements made in the above quotation are well founded, it would seem highly desirable that further conferences should be had in these matters. As is well known, the geographical boundaries of the city of Los Angeles ramify in and out between other incorporated cities of the county. The unincorporated territory of the county of Los Angeles does likewise, so that the city of San Fernando, for instance, is completely surrounded by unincorporated territory of the county of Los Angeles. What adds to the confusion is that by our California law, school districts not infrequently lap over from the confines of one city into the territory of other cities and/or into unincorporated county territory. In public health work such geographical boundaries constantly present problems of jurisdiction, because infectious diseases give no heed to such artificial boundaries. In quarantinable school diseases, for instance, it thus sometimes happens that the question of responsibility over a child is a matter in which, at one and the same time, one or two city health officers, a county health officer and a medical school inspector can all become involved.

With public health situations such as these constantly arising, and with real economic hardships facing many citizens who are called upon to pay taxes and public assessments in these days of eco-

nomic depression, the plan of having one or more conferences on ways and means to hold down public health expenditures should be given very serious consideration. As stated before such efforts have been made in Los Angeles city and county during the last several years. It will be interesting to note whether any progress in these important public health and civic matters will be possible.

* * *

Initial Conferences Will Be Commenced.—After the above was written, the following item appeared in the Los Angeles newspapers:

"To coöperate with a special committee named by county officials to eliminate overlapping services between the county and city, the city health board yesterday selected three business men as its representatives."

The Board of Supervisors of Los Angeles County probably will appoint a similar conference committee. It is to be hoped that if real conferences for consolidation of the departments are in mind or are undertaken, at least one member of the medical profession will be appointed to each of the conference committees, because otherwise important public health policies might be decided by conference committees of laymen who, being in the majority, would be distinguished not by how much, but perhaps by how little they really know of the relative value and importance of different phases of public health work. Or, to put it otherwise, while public health work should be carried on along lines of real economy, in the decision as to where such economies may be best effected, the advice of citizens who have a medical background and knowledge could be of great value. It is hoped that these initial efforts for elimination of duplication work in milk inspection and so on will lead to a real survey of these two public health departments which have annual expenditures exceeding those of many states in the Union.

PURE FOOD LAWS—MILK: BOTH RAW AND PASTEURIZED

Pure Food and Drug Laws Inaugurated Twenty-five Years Ago.—Twenty-five years ago, Wiley and others who had been carrying on a campaign to educate the citizens of the United States on the importance of protection of food supplies, saw some of their efforts to better safeguard the public health finally meet with success. The national pure food and drug law which then came into being made it possible for virtually the first time to maintain some semblance of control over the production and distribution of foodstuffs; at least as regards foods and drugs distributed under interstate conditions. Not the least of the legal regulations which were at that time brought into being, were those dealing with "misbranding" of foods and drugs.

The passage of that national food and drug law and the subsequent adoption of its essential provisions by most of the states of the Union, permitted public health departments from one end of the country to the other to maintain at least a nominal supervision over foodstuffs and drugs; which otherwise, in adulerated or misbranded form, could become serious menaces to the health of the people.

* * *

Difficulties of Enforcement of Pure Food Laws.—The original laws of twenty-five or so years ago represented a big advance on what existed at that time. With increasing knowledge and experience, those laws should have been amended to make them more capable of dealing with the legal and other complexities which constantly arose when attempts were made to enforce the provisions of the various acts. However, the selfish commercialism of some dealers—whose dominating thought was larger financial profits, without regard to the purity of their products or the deleterious effects of adulterated or below standard food products upon the public health—made difficult the enforcement of some of the laws; this because of the recourse to legal action and technicalities by some of such grasping food purveyors and distributors. Further, as such groups learned how modern day advertising and propaganda—no matter how far removed from the truth—could be used to exploit and increase the sales of their below standard products, they turned with increasing alacrity to all those quips and turns in legal procedures that would enable them to reap the largest possible amount of financial profit, regardless at what cost of health or happiness to others. Had it not been for the loyal support and high-minded coöperation of the maligned public health administrators, the struggle for adequate protection of the public health in these matters might almost have been in vain. The medical profession has reason to take pride in the very creditable part which its members, here and there, have played in the enforcement of the various national, state and local pure food laws.

* * *

"Certified Milk" Came Into Being About the Same Time.—About the same time that the present-day protection of manufactured food and drug products was inaugurated, there came into being what was practically a national attempt to place milk production and distribution on a more satisfactory basis. One of the educational elements that exercised a tremendous influence in providing better safeguards in the production and distribution of milk, was the happy thought of Dr. Henry Coit of Newark, New Jersey, in copyrighting the term "Certified Milk" and in outlining the conditions under which and by whom that term could be used. In Coit's plan, the production of a pure raw and uncontaminated raw milk, to be known as "certified milk" was to be under the supervision of milk commissions of county medical associations. In California, it is just about twenty-five years since the Milk Commission of the San Francisco County Medical Association and the Milk Commission of the Los Angeles County Medical Association came into being.

Those Commissions have never lapsed in their efforts to place pure milk at the disposal of the citizens of their districts.

About the same time, the Dairy Division of the United States Bureau of Animal Industry brought out one of its first score cards to be used in the grading of dairies. The writer, as secretary of the Los Angeles Commission, well remembers the early efforts of the members of that Commission to score not only their one certified dairy of that period, but also other non-certified dairies, whose owners they were trying to educate on how cows should be housed, fed, cleaned and milked, how the milk should be handled, cared for and distributed, and by whom. Since that day, state, county and municipal laws have been enacted that in good part place the responsibility of the production and distribution of milk on the executives of the various state and local health departments.

As time went on, California deemed it proper to provide that all natural milk sold within the state should be either raw or pasteurized. For a quite lengthy period, there was considerable opposition to a pasteurized milk on the grounds that it was not so desirable as a foodstuff for infants and children, and because it might make "dirty milk" presumably safe. The prejudice against pasteurized milk has largely subsided and as regards contaminated milk, the modern inspection methods of state, counties and cities, hold the production of such contaminated milk down to a minimum.

* * *

California Has Three Types of Raw Milk.—California permits the production, distribution and sale of three types of raw milk: certified, guaranteed raw, and grade A raw milk.

It has been stated that only fifteen per cent of the milk distributed in Los Angeles city is raw milk, all the remaining milk being pasteurized milk. This raw milk includes all certified, guaranteed raw and grade A raw milk.

During the last several years the certified dairies have been making very strenuous efforts to do away with the possibility of undulent fever in their herds, and this effort has been in good part successful. Figures which have been brought forward would indicate that there has been an increase of something like 500 per cent in undulent fever in general dairy herds of Los Angeles County during the last four years.

It is not necessary to discuss the great precautions which surround the production of the raw milk known as "certified." It is regrettable that the extra care in the production of certified milk necessitates a distinctly higher selling price than that of other milks, but that is a something that cannot be overcome.

* * *

Shall "Guaranteed Raw" and "Grade A Raw" Milk Be Discontinued?—The interesting question concerning "guaranteed raw" and "grade A raw" milk which confronts the dairy industry, the medical profession and the lay public is whether or not these two types of raw milk should continue to have legal state sanction. The argument has been brought forward that these two types of raw milk are in one sense imitators of certified raw milk, without having the same meticulous supervision in production and distribution. Or as has been stated, these two types of raw milk aim to capitalize for financial advantage, the prestige of a special grade of milk known as "certified."

There is a strong group of public health officers who contend that the state milk law of California should be amended so that all milk produced and distributed in California, except "certified milk," should be pasteurized. In other words, that the raw milk grade, known as "guaranteed raw" and "grade A" should be discontinued. Such amendments will probably be presented at the next session of the California legislature. Because of the importance of milk as an essential foodstuff for infants and many invalids a very considerable interest will be maintained in these matters by many physicians.

Man Who Invented Thermometer Once Known as Bad Boy.—Daniel Gabriel Fahrenheit, the man who invented the mercury thermometer, and whose name has been perpetuated throughout the English-speaking world for the past two centuries in connection with that invention, was apparently a typical Peck's bad boy and a typical "rounder," in his youth.

This fact is indicated by a letter dated January 21, 1707, which was recently found in the archives of the city of Danzig, Germany.

According to the letter, young Fahrenheit, at the age of 21, was causing his guardians so much trouble and was so incorrigible that the city council was requested to aid in shipping him away to the Dutch East Indies. Luckily the plan was not successful.

The letter, which was addressed to the burgomaster and the honorable gentlemen of the Danzig town council, reads as follows:

"We, who have been named as the guardians of the minor children of the late Daniel Fahrenheit, have sent his son, Daniel Gabriel, a minor, to Amsterdam by his own consent, to serve in an office, in the hope he would learn to conduct himself properly. But things have gone badly with this minor; he has spent the money given him; and he has behaved himself regrettably in other ways. So, in order to protect the interests of his brothers and sisters, we have been obliged to sequester part of his capital, and have requested him through his patron to turn a new leaf.

"But he has paid no heed, he has resumed his former practices, so we have been put to not a little trouble and pains to try to bring about a change for the better in his mode of life, but without being able to do anything with him. We finally, on his own representation, decided to have him sent to the East Indies, for which purpose we dispatched him to Amsterdam a few weeks ago and sent order to a certain merchant (firm) by the name of Johannes Droogenhorst and Son to help him to a place with the East India Company, which was done. But when the time came for him to present himself, he failed to appear, and according to a report that has come in he has gone to the bad again, and resumed his former way of life. Because we can see nothing ahead for him except destruction and dire ruin to his temporal well-being, we guardians desire to report the situation to the honorable council, as his supreme guardians, hoping that the council with the help and advice of the authorities request—that we be authorized to send full powers issued under the seal of the town to the said Droogenhorst and Son in Amsterdam, instructing them to locate him with the help of the authorities, place him under arrest, and send him to an appropriate place in the East Indies at the earliest opportunity."— *U. C. Clip Sheet.*

MEDICINE TODAY

This department of California and Western Medicine presents editorial comment by contributing members on items of medical progress, science and practice, and on topics from recent medical books or journals. An invitation is extended to every member of the California, Nevada and Utah Medical Associations to submit brief editorial discussions suitable for publication in this department. No presentation should be over five hundred words in length.

The Prevention of Mental Disease.—There are more patients under treatment for mental and nervous disease in institutions in this country than in the remaining institutions which care for all other types of illness combined. There are more mental patients under institutional care than there are students in our universities. One out of every 325 people is in a hospital for mental disease. These are appalling figures when thus brought to our attention.

As in all other fields of medicine, prevention offers more hope than cure, and early diagnosis becomes of paramount importance. Someone has said the cure of mental deficiency starts with the grandparents. The recognition of inheritance as a factor in the production of defectives led California to pass a law permitting the sterilization of the unfit. In our State we have sterilized more of the mentally unfit than in any other state, a few thousand in all. This is but scratching the surface of the problem. Sterilization should be carried out more freely and as much help as possible obtained in this manner. When a mental defective of twenty-nine comes before one of our superior courts for commitment to the school for feebleminded, and has the record of giving birth to seven children, all defective, while the department of public charity of the county has supported the family financially for the last six years, it would seem that our sterilization law needs better enforcement and our charity, better supervision.

Segregation of those unfit to propagate offers a more readily accepted method of diminishing the production of defectives. Our state institutions, especially in the southern part of the state, are greatly overcrowded. More institutions for special types of cases are needed, especially of the farm and industrial order. A large and apparently increasing class of constitutionally psychopathic individuals undoubtedly convey defective inheritance to their offspring. At the present time we have no institution that will take these patients, no laws that will hold them in institutions. State colonies where such individuals can be placed and made to do productive work for the state would make them at first largely self-supporting and would later more than repay the necessary initial investment.

Early environmental conditions are of tremendous importance and at least partially controllable. Measures of physical hygiene, proper nourishment, the correction of physical disabilities—all serve to prevent development of mental and nervous disorders.

The nursery schools, neuropsychiatric consultations in the grade schools, in the high schools, and in the universities are accomplishing much. Education of the teachers and available expert advice is a most important part of such service. General education of the public through child guidance and other clinics and the numerous activities of the various associations for mental and social hygiene have already disseminated accurate knowledge along mental hygiene lines.

The individual physician must do his share by increasing his own insight and knowledge and by sharpening his diagnostic acumen along the lines of personality study. He must aid by sharing his special knowledge and broader viewpoint with his patients while recognizing his own limitations and insisting on special aid when his own ability to help has been exhausted.

Education of the general public and especially of the nurse, teacher, patient, medical student, and physician, is the keynote in the prevention of mental and nervous disorders.

H. Douglas Eaton, Los Angeles.

Some Recent Developments in the Physiology of Muscle.—The researches of Hill, Meyerhof, and others, during the last decade led to the development of a fairly definite conception of the nature and rôle of the several chemical reactions concomitant with muscular contraction, which the writer briefly outlined in a previous paper.[1] The recent findings of Lundsgaard,[2] confirmed by Meyerhof [3] and others, make it necessary to modify these ideas in some essential details.

In 1887 Pohl found that mono-iodo-acetic acid (hereafter called IA) interfered with the production of lactic acid in excised muscle on standing.[4] This inhibition was rediscovered by Lundsgaard (loc. cit.), who has shown that muscles poisoned with IA will contract when stimulated, although no production of lactic acid is associated with this contraction. Under these conditions phosphagen decomposes more rapidly than normal, and the amount of this breakdown is proportional to the mechanical work done during contraction. When phosphagen is all used up, the muscle goes into rigor.

These observations indicate that phosphagen and not lactic acid is the substance most intimately related to the mechanical response. Under normal conditions phosphagen resynthesis is very rapid in comparison with lactic acid resynthesis,

1 Field, J.: California and West. Med., Vol 33, No. 6, 1930; Vol. 34, No. 1, 1931.
2 Lundsgaard, E.: Biochem. Ztschr., 217:162, 1930.
3 Meyerhof, O.: Lancet, 2:1415, 1930.
4 Pohl: Arch. f. exp. Path. u. Pharmakol., 24:149, 1887.

and is effected by energy derived from lactic acid production,[3] hence it was not until the lactic acid cycle was removed from the picture that the significance of phosphagen could be appreciated.

In these experiments the question of the specificity of IA arises. Is it a general enzymic poison or does it act particularly on enzymes important in the lactic acid or Meyerhof cycle? Present evidence favors the latter view. For example, Lundsgaard found that IA affected neither glycogenolysis nor phosphagen hydrolysis in concentrations which completely suppressed the Meyerhof cycle (one part in 25,000). It does not disturb the action of ptyalin or of invertase,[5] and while it checks yeast fermentation (a process very like lactic acid formation[6]) Lundsgaard reports that it does not interfere with the oxidative metabolism of yeast.

What are the features of "alactic acid contraction"? Apparently the electrical and mechanical responses in the isometric twitch are quite normal in the early members of a series of contractions[8] although the onset of fatigue is more abrupt, and the muscle will perform only about a fourth as much work as in the absence of IA.[3]

Rather complicated changes occur in the thermal response. In previous papers[9] it was pointed out that the heat production in an isometric twitch is diphasic. The first phase, the "initial heat" of A. V. Hill is concomitant with contraction and relaxation and is anaërobic, while the second phase, "recovery heat," follows the mechanical response and is chiefly aërobic. The initial heat in turn is diphasic, 65 to 70 per cent being associated with contraction, 35 to 30 per cent with relaxation. IA has little effect on the amount or distribution of the initial heat in the first few contractions of a series, but if the poisoned muscle be stimulated to complete exhaustion the total anaërobic heat is reduced some 58 per cent.[10, 11]

The recovery heat is also affected. Little changed in the first few contractions of a series, it soon begins to decrease more rapidly than the initial heat. A. V. Hill and coworkers have inferred a dual rôle for IA: an action upon the lactic acid forming system; and an action upon a system using energy from oxidation for recovery (resynthesis of phosphagen, etc.).[12] Systems of the latter type exist, since muscles poisoned with IA will do more work in oxygen than in nitrogen.

Some generalities are interesting. Warburg[13] and others have shown that the Meyerhof cycle is of widespread occurrence, being especially notable in embryonic and cancerous tissue. In muscle, IA interferes with the cycle by poisoning glyoxalase, the enzyme catalysing the formation of lactic acid from its immediate precursor, methyl glyoxal;[14] of course previously linked reactions may also be checked. While the mechanism of lactic acid production in cancer is probably unlike that in muscle, Harrison and Mellanby found that IA inhibits the Meyerhof cycle in mouse carcinoma 63, both *in vitro* and *in vivo* (intravenous injection). It must be emphasized that lethal doses of the very poisonous IA were required to produce the latter effect.[15]

In summary: The rediscovery of the Pohl effect has caused fundamental changes in our conception of the rôle of the Meyerhof cycle in functional metabolism. It has also placed in our hands interesting and valuable reagents for analyzing carbohydrate metabolism, viz., the monohalogenated acetic acids. We may reasonably look for significant increase in our knowledge of the animal economy in consequence.

JOHN FIELD, Stanford University.

5 Lundsgaard, E.: Biochem. Ztschr., 220:1, 1930.

6 Meyerhof, O.: Chemical Dynamics of Living Matter, 1921.

7 Lundsgaard, E.: Biochem. Ztschr., 220:8, 1930.

8 Henriques, V., and Lundsgaard, E.: Biochem. Ztschr., 236:219, 1930.

9 Field, J.: California and West. Med., Vol. 34, No. 6, 1931; Vol. 35, No. 1, 1931.

10 Hartree, W.: J. Physiol., 72:1, 1931.

11 Hukuda, K.: J. Physiol., 72:438, 1931.

12 Hill, A. V., and others: Proc. Roy. Soc., B, 108:279, 1931.

13 Warburg, O.: Über den Stoffwechsel der Tumoren, 1926.

14 Dudley, H. W.: Biochem. J., 25:439, 1931.

15 Harrison, S. T., and Mellanby, E.: Biochem. J., 25:770, 1931.

Alleged Mobilization of Antibodies in Nervous Tissues.—It is generally believed that unless the meninges are inflamed, humoral antibodies rarely penetrate in effective amounts into the cerebrospinal fluid. The practical conclusion has been drawn that in brain and cord infections therapeutic antisera are most effective if injected by lumbar puncture. Uncertainty as to the validity of this conclusion is expressed by Dr. Jules Freund of the Phipps Institute, Philadelphia,[1] who for the first time has compared quantitatively the antibody content of the brain and surrounding fluids.

Doctor Freund found that in rabbits, when the penetration of typhoid agglutinins from the blood stream into the cerebrospinal fluid is complete, the numerical relationship between the specific titer of the rabbit's serum and spinal fluid is 400:1. The corresponding antibody ratio in the serum and brain is 125:1. Which means that the antibody concentration is three times higher in the brain than in the surrounding fluid. Moreover, this relatively high titer in the nervous tissues is reached within ten minutes after intravenous injection of an antiserum, while the maximum in the cerebrospinal fluid is delayed for many hours.

Doctor Freund concludes from this evidence that the cerebrospinal fluid is not the immediate source of effective central nervous system antibodies, and that there is no physiological reason for the current belief in the increased efficiency of local injections. Whether or not the central nervous system antibodies measured by him are contained in the nerve cells or in the local reticuloendothelial system has not yet been determined.

W. H. MANWARING, Stanford University.

1 Freund, J.: Accumulation of Antibodies in the Central Nervous System, Jour. Exper. Med., 51:889 (June), 1930.

Ovogenesis and the Normal Follicular Cycle in Adult Mammalia.*—Ovogenesis in the rat, guinea-pig, dog, cat, and man, occurs throughout the whole period of sexual life in a rhythm fundamentally related to the ovulation cycle. In all cases the new birth of eggs occurs in large numbers throughout metestrum and anestrum. In the latter phases of this production a striking picture is produced in the ovary.

The final maturity and ovulation of a selected group of follicles or a single follicle involves the destruction of all remaining follicles. In the dog and cat this extensive production and sweeping destruction of follicles is an impressive phenomena. The destruction seems complete, and immediately following ovulation the next succeeding ovogenetic wave begins. This is called the "follicular cycle." In the rat, guinea-pig, and dog, the follicular cycle coincides normally with the estrus cycle. In the cat the two cycles may or may not coincide. In man the follicular cycle has no necessary relation to the menstrual cycle, ovulation taking place at any time during the latter cycle.

The ova arise by proliferations from the germinal epithelium in the form of invaginations or cords, forming groups of epithelial cells which are cut off from the epithelium and pass through the tunica albuginea. From one to many cells in each group enlarge and develop into sex cells, the remaining epithelial cells in the group forming the follicle cells. Extensive degeneration of the sex cells is a normal process in each cycle. This occurs to some extent at all periods, but reaches its maximum at anestrum or proestrum, extending into the next cycle, and resulting in the almost complete destruction of the enormous numbers formed during that cycle. It occurs at all stages of growth of both ova and follicles. Degeneration usually begins in the granulosa cells, but occasionally the first indications may be found in the ovum. In polyovular follicles, one or more ova usually degenerate before the others.

Estrum marks the end of the preceding wave of ovogenesis and follicular development and the beginning of the next wave in the rat, guinea-pig, and dog. It is the period at which the fewest sex cells, other than atretic ones, are to be found in the ovary. In the cat and man the ovulation period marks the end of one wave and the beginning of the next. New sex cells are formed at all periods of the cycle, but the number of these increase gradually, beginning with early metestrum to the end of the cycle. During late pregnancy and in anestrum and proestrum very large numbers are present. During pregnancy the rhythm of the follicular cycle is not obliterated. In the rat, which has a gestation period of four or five times the length of the estrous cycle, four or five cycles of the production of eggs and follicles and their degeneration occur during the period. Recurring cycles are also found in the guinea-pig. In the rat the number of ova produced is smaller than in the other mammals, but the sequence of events in the follicular cycle is the same, though the short length of the cycle results in a telescoping of the different phases. In man there is the same evident relation of ovogenesis to the ovulation cycle which seems to characterize the mammalia generally.

Ovulation in man seems to occur at approximate intervals of twenty-eight days. This rhythm bears no exact or invariable relation to the menstrual cycle. The preliminary maturation phases so characteristic of the male germ cells are not found in the ova of these adult mammals. In the monkey the follicular cycle has been only partially investigated. Ovogenesis takes place in the same manner as in the other mammals. Ovulation apparently takes place at any time in the menstrual cycle. The concept that in the mammalia the ova are all formed before birth and remain quiescent until sexual maturity calls them into activity, has no foundation in fact. On the contrary, all the ova of adult life are new formations and are being constantly produced and as constantly destroyed. These processes are part of the rhythmic production and destruction of the tissue in the generative tract which is without parallel in any other organ in the body, the sex cells having probably the shortest life span of any cells in the body.

HERBERT M. EVANS, Berkeley.
OLIVE SWEZY, Berkeley.

* Being a discussion of a paper by Herbert M. Evans, M. D., and Olive Swezy, Ph. D., printed in University of California Memoir Series, Vol. 9, pp. 119-224; eighteen plates and sixteen figures in text.

Avoidable Causes That Lead to Malpractice Suits.—Some do's and don'ts concerning the subject of threatened malpractice suits are given in a very instructive article in the *New England Journal of Medicine* for April 16, 1931. Among other interesting items we note the following: "A fluoroscope has its place, no doubt, but in diagnosing fracture and discerning apposition there is no substitute for an x-ray. The x-ray is evidence that can be produced. It is concrete. What you saw in the fluoroscope was happening at the time, but it cannot be produced to prove that you got apposition when later the patient removes his cast without your knowledge or does some other act that causes loss of apposition. Here is another timely suggestion: "Please don't criticize, particularly to the patient, the treatment given by some other doctor before the patient came to you. You see the result, nothing more. You do not know the whole story. You do not know what the original condition was, what the other man encountered in the way of difficulties or whether he had proper cooperation from the patient. Wait until the evidence is all in. You may have to change your mind when you get all the facts. You may be wiser but at least you will know what you are talking about." To this we may add the injunction to be careful about what you say and to whom you say it, for in an unguarded moment you may give to a relative, or even a lawyer, a club that later will be used to beat you, and always remember that there are plenty of people who are trying to get something for nothing and it is easy to attempt to blackmail a physician and force him to pay indemnity for an alleged malpractice.—*Journal of the Indiana State Medical Association.*

Live in the ward. Do not waste the hours of daylight in listening to that which you may read by night. But when you have seen, read. And when you can, read the original descriptions of the masters who, with crude methods of study saw so clearly.—Osler, the Teacher.

STATE MEDICAL ASSOCIATIONS

CALIFORNIA MEDICAL ASSOCIATION*

JUNIUS B. HARRIS.....President
JOSEPH M. KING.....President-Elect
EMMA W. POPE.....Secretary

OFFICIAL NOTICE

Next Council Meeting.—The date of the next meeting of the Council has been set for January 16. The meeting will be held in the offices of the Association, 2004 Four Fifty Sutter Street, San Francisco.

COMPONENT COUNTY SOCIETIES

CONTRA COSTA COUNTY

The annual banquet of the Contra Costa County Medical Society was held at the Carquinez Hotel, Richmond, on the evening of December 5, with forty members and their wives, and members of the dental profession as guests. The hall and tables were beautifully decorated under the able direction of Mrs. C. R. Blake, president of the Woman's Auxiliary. Dr. U. S. Abbott served as toastmaster. A varied program of professional entertainment was enjoyed between courses, following which short remarks were made by the retiring officers, Dr. W. A. Rowell, president, and Dr. L. H. Fraser, secretary; Dr. S. N. Weil, president-elect; Mrs. C. R. Blake, president of the auxiliary; Dr. L. A. Hewitt, president of the dental association; and Dr. Clara Spalding, incoming secretary. The new members admitted to the society during the past year were introduced by the secretary. Dr. G. M. Bumgarner spoke as representative of the older members of the profession. Mrs. S. N. Weil, vice-president of the State Auxiliary; Doctors Kaho Daily, J. B. Spalding, and H. G. Ford also made remarks.

Following the dinner, speeches, entertainment and dancing was enjoyed until a late hour.

L. H. FRASER, *Secretary.*

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FRESNO COUNTY

The regular meeting of the Fresno County Medical Society was held at the Californian Hotel at 8:30 p. m. on October 6.

The name of Dr. Clayton I. Pendergrass of Clovis was presented for membership.

It was moved by Doctor Madden that the medical society go on record endorsing the reappointment of Dr. Charles B. Pinkham as secretary of the Board of Medical Examiners; seconded by Doctor Trowbridge, and carried. Doctor Madden was appointed chairman of a committee to draw up the resolutions to present to the Governor.

Mrs. Cooper made a short appeal in behalf of the Community Chest.

Doctor Dau moved that the medical society go on record as opposed to the increasing of veterans' hospitals and beds, and favor the distribution and treatment of veterans in local community hospitals and personnel; seconded by Dr. C. D. Collins, and carried. Doctor Dau was appointed chairman of committee to draw up resolutions to this effect, to be forwarded to the proper representative at Washington.

Dr. A. E. Anderson presented a letter asking the coöperation in regular examinations of women to assist in control of cancer of the cervix. Doctor Anderson was appointed chairman of local committee to promote these annual examinations.

Dr. William Nance Anderson of Los Angeles then presented the clinical paper of the evening, "Physical Examinations of the Heart," stressing the general physical examination, and finally the local heart examination. Discussion by Doctor Tupper.

Mr. Davidson of the Board of Medical Examiners then presented a dissertation on "Herb Doctors," pointing out their quackeries and absurdities.

A resolution on the death of Dr. T. M. Hayden was presented by Dr. G. A. Hare.

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The regular meeting of the Fresno County Medical Society was held at the Californian Hotel at 8 p. m. on December 1.

Dr. D. I. Aller presented the recommendations from the Crippled Children's Society, which were adopted. Dr. Charles A. James was appointed as the medical society member to the Crippled Children's Society.

Dr. J. E. Pendergrass of Clovis and Dr. Hyman Ginsberg of Fresno were elected to membership, and Dr. B. F. Walker was transferred from Stockton.

Doctor Mitchell moved that the society authorize the formation of a Woman's Auxiliary; motion was seconded by Doctor Hare. After discussion a vote was taken and the motion was lost.

List of officers nominated for 1932 by Doctor Madden, chairman of the Nominating Committee. Moved by Doctor Tupper, seconded by Doctor Madden, that the secretary cast the ballot for the officers nominated. Carried. The following are the officers for the ensuing year: Edwin R. Scarboro, president; N. J. Dau, first vice-president; W. F. Stein, second vice-president; E. J. Schmidt, secretary; H. O. Randel, assistant secretary.

Delegates—D. I. Aller, Guy Manson, and T. F. Madden.

Alternates—A. E. Anderson, C. O. Mitchell, and J. D. Morgan.

Board of Governors—Frank Tillman.

Dr. Walter Boardman of San Francisco presented the clinical paper of the evening on "Jaundice," illustrated with lantern slides. His instructive paper dealt with the various types of bile formation, the elimination of bile, and the pathology involved.

E. R. SCARBORO, *Secretary.*

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MARIN COUNTY

The regular meeting of the Marin County Medical Society was held in the City Hall, San Rafael, at 8 p. m. on December 3. The meeting was called to order by the president.

A letter from Dr. William Duffield of Los Angeles, representing the California League for the Preservation of Professional Rights, urged the county societies to indorse the reappointment of Dr. Charles B. Pinkham as secretary of the Board of Medical Examiners for the State of California. Following this a resolution was duly passed recommending the reappointment of Doctor Pinkham, and the secretary was instructed to forward the same to Governor James Rolph, Jr.

A communication from the state secretary called attention to the letter addressed to all members of the California Medical Association from E. Raymond Cato, chief of the California Highway Patrol, explaining the present status of the hospital ambulance service in automobile accident cases and urging each

* For a complete list of general officers, of standing committees, of section officers, and of executive officers of the component county societies, see index reference on the front cover, under Miscellany.

county medical society to study its own local condition. Following the reading of this communication a committee consisting of Doctors Delancy, Hund, and Clark was appointed by the president to study the ambulance situation and report at the next regular meeting.

A communication from the secretary of the Sonoma County Medical Society announced a four-county meeting to be held at the Sonoma Mission Inn at 7 p. m. on December 10, the subject of the meeting to be "Medical Economics." Dr. J. B. Harris, state president; Dr. John H. Graves, Dr. Morton Gibbons, and Mr. Hartley Peart were scheduled to address the meeting. The four counties to be represented will be Napa, Solano, Marin, and Sonoma. Practically all the members present signified their intention of attending the meeting, which will begin with dinner at 7 p. m.

A letter from the Petrolagar Laboratories offered to show several surgical talkie films at the regular meeting of the society. The secretary was instructed to arrange a date and select his subject for the pictures.

Another letter from Dr. Harry Spiro was read offering a paper on the "Treatment of Acute Coronary Artery Occlusion." The letter was placed on file.

Dr. L. L. Stanley called the attention of the members to an article in the October 1931 issue of CALIFORNIA AND WESTERN MEDICINE. He urged the appointment by each county medical society of a standing county hospital committee whose duties were outlined in the article. Motion was made by Doctor Stanley, and seconded by Doctor Perry, that such a committee be appointed by the president. Motion passed. Doctors Perry, Clark, and Robinson were appointed on this committee.

Doctor Hund moved that a committee on by-laws be appointed. The motion was passed and the trustees, Doctors Kuser, Larson, and Howitt, were appointed on this committee.

The following officers were unanimously nominated and elected for the year 1932: C. A. Delancy, president; Charna Perry, vice-president; L. L. Robinson, secretary-treasurer.

Trustees—H. O. Howitt, J. H. Kuser, and C. F. Larson.

Delegate to the state convention—H. O. Howitt.

Alternate—J. H. Kuser.

At the suggestion of the secretary it was decided to hold the annual banquet for the installation of officers in January. The secretary was instructed to notify all members, and if possible to secure the Meadow Golf Club for this meeting.

Members present were: Doctors Howitt, Stanley, Hawkins, Delancy, Hund, Duffacy, Clark, Kuser, Perry, and Robinson.

L. L. ROBINSON, *Secretary.*

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PLACER COUNTY

The Placer County Medical Society held its annual meeting in the auditorium of the Freeman Hotel on November 28, the president, Dr. Robert H. Eveleth, presiding.

There were present the following members and visitors: Members—Doctors Eveleth, Russell, Fay, Kalman, P. D. Barnes, L. B. Barnes, Mackay, Rooney, C. C. Briner, Monica Stoy Briner, Thoren, Lewis, and Peers. Visitors—Dr. J. B. Harris, president of the California Medical Association; and Dr. H. M. Kanner of Sacramento.

After disposal of the minutes of the two previous meetings, the election of officers for 1932 was held, resulting in the election of the following members to office: Robert H. Eveleth, Roseville, president; L. B. Barnes, Newcastle, vice-president; Robert A. Peers, Colfax, secretary-treasurer; Charles J. Durand, Colfax, associate secretary-treasurer.

Delegate to California Medical Association—William M. Miller, Auburn.

Alternate—C. E. Lewis, Auburn.

The reports of the secretary-treasurer were read and approved.

The application of Dr. David M. Kindopp of Colfax for membership was read. Doctor Kindopp was unanimously elected to membership.

Following the reading of communications from the state office, the following action was taken:

1. In the matter of the ambulance and hospital situation as relating to motor-vehicle accident casualties and brought to the attention of the society through a letter from Mr. E. Raymond Cato, chief of the Highway Patrol, the matter, by order of the president, was turned over to Doctors Mackay and Lewis to investigate and bring in a report.

2. Relating to the Department of Public Relations of the California Medical Association, it was decided to coöperate with the Sacramento Society for Medical Improvement. Doctor Harris promised to endeavor to have a joint meeting of the county societies of the eighth district for the purpose of explanation in order that the members of the district may be thoroughly informed regarding this very important department, and in order that the members of the medical profession of this district may give 100 per cent cooperation.

3. Relating to the expiration of the term of Dr. Charles B. Pinkham as member of the California Board of Medical Examiners, a resolution endorsing Doctor Pinkham's candidacy was presented, and carried. The secretary was instructed to write to the Hon. James Rolph, Jr., enclosing a copy of the resolution.

Dr. Robert F. Rooney, dean of the medical profession in California and president of the California Medical Association for 1905-1906 and 1906-1907, addressed the society calling attention to two matters of importance:

1. The need of greater haste in the preparation of the history of medicine and of pioneer medical men in California.

2. The danger of allowing various cultists to monopolize the positions as instructors of the public regarding foods and food values. He urged the members of the medical profession to take the time and devote the energy necessary to the spread of proper and safe information as to the modern conception of food values and other information relating to diet necessary for the lay public. This was generally discussed.

The president then introduced Dr. Junius B. Harris, president of the California Medical Association, who addressed the society on various problems of present interest to the medical profession. Among other topics discussed were:

1. Status of the present Medical Library bill and the appropriation therefor.

2. The Department of Public Relations. Dr. Harris explained fully what the department is, what its aims are, the personnel and the duties of its personnel. He urged 100 per cent coöperation by the members of the Placer County Medical Society.

3. The Cancer Commission recently established by action of the House of Delegates.

4. The County Hospital situation in California: Doctor Harris cited a number of counties in which the present method of handling county hospitals is working a hardship on the physician and private hospitals; is creating differences and dissatisfaction between indigent and pay patients, and is placing unnecessary and unjust burdens upon the taxpayers. He urged our members to see that no such problems are raised by the new Placer County Hospital now in course of construction.

5. The symposium in the September number of CALIFORNIA AND WESTERN MEDICINE. Doctor Harris requested all who have not read this symposium to do so.

6. The value of making of proper contact with individuals and with the various organizations within this district in order that the people may be properly educated regarding the aims of organized medicine for better health, better medical and better hospital practice.

Doctor Eveleth, on behalf of the Placer County Medical Society, thanked Doctor Harris for his very splendid and very instructive talk.

ROBERT A. PEERS, *Secretary.*

RIVERSIDE COUNTY

At the regular December meeting of the Riverside County Medical Society, Dr. B. E. Garrison was unanimously elected to membership in our society.

Dr. Mott Arnold, councilor for our district, and Dr. R. A. Cushman favored us with a visit and brought the greetings of the California Medical Association. They discussed various matters of interest to the medical profession.

Election of officers for the year 1932 resulted as follows: C. E. Atkinson, Banning, president; Hervey S. Faris, Riverside, vice-president; T. A. Card, Riverside, secretary-treasurer.

Delegates—T. A. Card and C. E. Atkinson.

Alternates—S. H. Keller and A. L. Bramkamp.

The program of the evening was on the subject of "Anesthesia," and was interestingly presented by Dr. E. Forrest Boyd and Dr. Arthur Guedel, both of Los Angeles. A four-reel motion picture of "Spinal Anesthesia" was then shown.

THOMAS A. CARD, *Secretary.*

SAN BERNARDINO COUNTY

The regular meeting of the San Bernardino County Medical Society was held on December 1 at the County Hospital. Seventy-five members and guests were present.

The meeting was called to order by the president at 8:10 p. m., and applications for membership of Doctors Atkinson and Lonergan were voted on and approved.

The program of the evening was then given:

"Spinal Anesthesia" by Dr. W. D. Wightman of Los Angeles, and a moving picture—"Technique of Surgical Spinal Anesthesia" in two reels in color shown by Doctor Wightman.

Discussion was opened by Dr. S. B. Richards, who used as a basis the analysis of five hundred cases of spinal anesthesia, which were done at the County Hospital during the past year.

Doctor Wightman, who is a specialist in anesthesia, was accompanied by a surgical colleague, Dr. Shuler Fagan of Los Angeles, who took part in the discussion.

E. J. EYTINGE, *Secretary.*

SAN JOAQUIN COUNTY

The stated meeting of the San Joaquin County Medical Society was held Thursday evening at 8:30 o'clock, on November 5 in the Medico-Dental clubrooms at 242 North Sutter Street, Stockton.

The meeting was called to order by President G. H. Rohrbacher.

District Councilor Doctor DeLappe of Modesto was present and, in response to a call from the chair, he outlined some of the policies of the State Association. He urged that as long as possible the same delegates to the State Medical Association be returned each year.

Moved by Doctor Kaplan, seconded by Doctor McGurk, that a committee be appointed to provide, at the society's expense, suitable Christmas gifts for the children of our former member, Doctor Maggs. Motion carried. The chair appointed Doctors Kaplan, Sanderson, and Gallegos.

On motion of Dr. B. J. Powell, Sr., seconded by Dr. Dewey R. Powell, and carried, the chair appointed a committee of three—Doctors B. J. Powell, Sr.; D. R. Powell, and Broaddus—to draw up a resolution expressing our sympathy and our sorrow because of the recent death of Dr. William Ellery Briggs of Sacramento and that copies be transmitted to the Northern District Eye, Ear, Nose, and Throat Society and to the family of the deceased. Further, that the San Joaquin County Medical Society be adjourned on this date in memory of Doctor Briggs.

The scientific paper of the evening was read by Dr. Gunther W. Nagel of Stanford Medical School on the subject, "Treatment of Duodenal and Gastric Ulcers." The doctor said the cause of gastric and duodenal ulcers is not known. A complete satisfactory mode of treatment for all cases has not been found. Duodenal ulcers tend to heal and should be treated medically unless there are definite contraindications for doing so. In certain cases of duodenal ulcer surgical treatment gives very satisfactory results. Duodenitis is a clinical and pathological entity and the treatment is the same as for duodenal ulcer. Gastric ulcer is a more serious problem than duodenal ulcer because of the possible presence of malignancy. Gastric ulcer is generally a surgical problem.

The paper was freely discussed by Doctors Barnes, Dameron, Kaplan, McGurk, Sheldon, and Williamson.

There being no further business the meeting adjourned in respectful memory of Dr. William Ellery Briggs.

C. A. BROADDUS, *Secretary.*

SONOMA COUNTY

At the Sonoma Mission Inn on December 10 a joint meeting of the Napa, Solano, Marin, and Sonoma County societies was held. Sixty-seven members and guests were present.

Dr. Junius Harris of Sacramento, Doctors John H. Graves and Morton Gibbons of San Francisco, with Hartley Peart, counsel for the State Society, were speaker guests of the evening. Their messages dealt with medical economics.

Dr. A. Morse Bowles, president of the Sonoma County Medical Society, presided.

Prior to the joint meeting, the Sonoma County Society held its regular monthly meeting and elected the following officers for the ensuing year: J. Leslie Spear, president; E. J. Finnerty, vice-president; W. C. Shipley, secretary; C. M. Carlson, treasurer.

Delegate—A. Morse Bowles.

Alternate—J. W. Seawell.

Censor—A. A. Thurlow.

The treasurer's report showed the society to be in a healthy financial condition.

The application of Dr. E. D. Barnett for membership, by transfer card from the Humboldt County Society, was received and accepted.

W. C. SHIPLEY, *Secretary.*

STANISLAUS COUNTY

The regular meeting of the Stanislaus County Medical Society was held at the Hotel Hughson on December 11. They had as their guests the members of the dental society.

There were present twenty-three dentists and eleven doctors.

New committees were appointed as follows:

Program Committee—Donald Robertson, R. S. Hiatt, and J. K. Morris.

Membership—H. E. Smith, C. E. Pearson, and E. G. Allen.

Public Relation—F. R. DeLappe, E. V. Falk, and R. E. Maxwell.

County Hospital—Donald Robertson, J. L. Collins, and Alfred M. Roscoe.

The speaker for the evening, Dr. Guy S. Millberry, gave a very interesting talk on "Present Trends in Health Service."

J. A. PORTER, *Secretary Pro Tem.*

TULARE COUNTY

The regular monthly meeting of the Tulare County Medical Society was held in Visalia on November 29.

Dinner was served at 7 p. m. The meeting was called to order by Dr. S. S. Ginsburg in the absence of the president, Dr. H. G. Campbell.

It was moved and carried that the regular December meeting be omitted.

Doctor Tourtillott was appointed chairman of an Obituary Committee to draft a fitting tribute to our deceased colleague, Dr. C. M. White, and have it remitted to the JOURNAL.

The secretary was instructed to petition the Governor respecting Doctor Pinkham's reappointment.

Dr. Samuel H. Hurwitz, associate professor Stanford University Medical School, the guest of the evening, gave a very interesting address upon the "Treatment of Asthma," which was followed by a lengthy discussion.

The following members were present: Doctors Hicks, Banks, Gilbert, Johnstone, Rivin, Mooney, Seiberth, Lipson, Furness, Guido, Weiss, Tourtillott, Preston, Leidig, McClure, Miller, Kohn, Zumwalt, Betts, and Ginsburg. Guests were: Doctors Neubert and Cobiee.

A vote of thanks was extended to Doctor Hurwitz for the most interesting address.

On December 6 the County Medical Society held the annual joint meeting with the Tulare County Bar Association, the latter being hosts to the doctors. The meeting opened at 8 p. m., preceded by a banquet. Mr. Crosby, the president of the State Bar Association, was the guest of the evening. The subject, "The Problems of the Professional Man," was of as great interest to the physicians as to the lawyers.

There were twenty-two physicians and forty-eight lawyers present.

S. S. GINSBURG, *Secretary.*

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VENTURA COUNTY

The regular monthly meeting of the Ventura County Medical Society was held on November 10 in the new wing of the County Hospital.

Members present were: Doctors Bardill, Smolt, Achenbach, Mosher, Hendricks, W. S. Clark, Homer, Bianchi, D. N. Clark, Welch, and Little. Visitors present were: Doctors Lillian Smolt, Hill, and Foskett.

Communications were read, after which there was discussion, followed by the presentation of a brief by Doctor Graves on state medicine.

It was decided that the December meeting should consist of a business and social one, at which time there would be the annual dinner of the society.

After the business meeting a scientific program followed, consisting of the presentation of cases in the County Hospital by Dr. W. S. Clark on bone and joint conditions, and by Doctor Smolt on tuberculosis. The cases were very well presented and were well received. There was open discussion on the cases presented, by the members.

* * *

The regular monthly meeting of the Ventura County Medical Society was held at Pierpont Inn, Ventura, on December 8, at which time the regular dinner and election of officers were held.

Members present were: Doctors Strong, Smolt, Welch, Little, Bianchi, W. S. Clark, Bardill, Shore, Coffey, Achenbach, Mosher, and Armitstead.

After a fine dinner, which was enjoyed by all, the communications were read.

The election of officers was held, Dr. W. S. Clark being elected president on the nomination of Doctor Achenbach, seconded by Doctor Bardill. Motion that nominations be closed was made by Doctor Armitstead, and seconded by Doctor Shore. Doctor Clark was elected by unanimous ballot. Doctor Hendricks was elected vice-president in a similar manner, being nominated by Doctor Bardill, Doctor Shore seconding the nomination. Doctor Strong was elected secretary with the motion by Doctor Armitstead, seconded by Doctor Bianchi, and was elected by unanimous ballot. Doctor Coffey was elected by unanimous vote to the office of alternate to the state convention for a period of two years on the motion of Doctor Achenbach, seconded by Doctor Bianchi.

It was voted that the secretary be instructed to draw up a resolution for the endorsement of Dr. Charles B. Pinkham and forward the same to Governor Rolph.

It was decided that the next meeting should be devoted to the constitution and by-laws of the local society.

R. B. ARMITSTEAD, *Secretary.*

IN MEMORIAM

Bemis, Orion Irving. Died at Modesto, December 7, 1931, age 62 years. Graduate of Bowdoin Medical School, Brunswick and Portland, Maine, 1896. Licensed in California, 1914. Doctor Bemis was a member of the Stanislaus County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Hamman, Amos F. Died September, 1931 age 57 years. Graduate of Rush Medical College, Chicago, 1903. Licensed in California, 1903. Doctor Hamman was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Langley, Elmer Ellsworth. Died November 12, 1931, age 49 years. Graduate of Baltimore Medical College, Maryland, 1905. Licensed in California, 1929. Doctor Langley was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Mahoney, Margaret Josephine. Died at San Francisco, December 7, 1931, age 73 years. Graduate of Cooper Medical College, San Francisco, 1895. Licensed in California, 1895. Doctor Mahoney was a member of the San Francisco County Medical Society, the California Medical Association, and the American Medical Association.

CHANGES IN MEMBERSHIP

New Members

Alameda County—Walter Rapaport.

Contra Costa County—Harry E. Peters.

Los Angeles County—Francis S. Bascom, Duncan Parham.

Orange County—Paul E. Rumph.

San Bernardino County—Charles A. Love, Jr.

San Diego County—Arthur A. Beale, Damon E. Corbin, Lewis C. Covington, Harry W. Dickerson, Vernon J. Erkenbeck, Christian A. S. Kemper, Glen H. McDonald, William F. Meyer.

Transfers

Francis S. Bascom, from Los Angeles to Alameda County.

Kaho Daily, from San Francisco to Contra Costa County.

Emanuel C. Ehlers, from San Bernardino to Orange County.

Lowrie Grow, from Los Angeles to San Diego County.

R. Christopher Leggo, from Solano to Contra Costa County.

John M. Scanland, from San Francisco to Napa County.

John Asher Wallace, from San Bernardino to Orange County.

DEPARTMENT OF PUBLIC RELATIONS OF THE CALIFORNIA MEDICAL ASSOCIATION

Its Search for a Director

The Department of Public Relations of the California Medical Association has had two meetings and the organization is now complete. It is ready for work. The problems before it are many and varied, and involve a complex picture of economics, social adjustments, and legislation.

The members of the committee have canvassed the Association for a man to act as a director of their newly formed department. According to the resolution, this man must be a doctor. However, there are many other prerequisites for this man. He must be a good speaker as well as a good fellow. He must be

a good organizer. He must be a man who has studied, and knows, the problems of medical economics. He must be a statistician, and know how to evaluate statistics. He must be a publicity man, and understand how to organize publicity. He must be a politician, and be able to follow legislative measures in our legislature, as well as organize the medical profession in legislative matters.

And, above all, he must be a man who is willing to act in accordance with the decisions and will of the Council of the California Medical Association and the Public Relations Committee.

Thus far, the committee have been unable to find this man, but they are not discouraged and they feel that there is such a man in our society who can take up the reins and act as the executive officer in a full-time position with the California Medical Association.

* * *

The letter below, dated December 9, 1931, was sent to Dr. O. D. Hamlin, Chairman of the Council, by Dr. Daniel Crosby of Oakland. It has to do with a discussion of some of the problems which face the newly created Public Relations Department of the California Medical Association, and is as follows:

Dear Doctor Hamlin:

After thinking a great deal about our conversation this afternoon, I have reverted to the conclusions that were borne in upon me after talking to Duffield in Los Angeles, viz.:

I. The rank and file of medical men in California or any state stand or fall upon public confidence or approval and earn their own fees—salaries being the exception.

II. The medical profession accords early and deep, though perhaps somewhat transient, confidence and respect to those of its group who accomplish or seriously seek to accomplish constructive things. Especially is this respect and confidence shown where no ulterior motive is evident in the effort and "job" might be considered ulterior motive.

III. The presence of any serious question of motive, mode of procedure, or quality of accomplishment, immediately marshals a group of disapprovers who precipitate, not conferences looking to an ironing out of difficulties, but frequently quarrels which have commonly the result of dividing any given group into stubborn unrelenting factions whose diverse and irreconcilable opinions result in the dispersal of any effects which might conciliate the factions or eliminate their disagreements.

IV. In the presence of such dispute, disagreement, and misunderstanding, a paid executive secretary is likely to find himself helplessly ground between two millstones, and, right or wrong, his efforts will be nullified.

V. Leadership to which selfish motives cannot be imputed is the only impelling force which will cause the greatest number of however diverse opinions, to unite for the common good.

VI. Therefore, instead of an executive secretary with salary, expense account, and office force, may I suggest:

1. Office force in accordance with requirements.
2. A division of the state into sections, each of which is presided over by a man of sufficient quality for this work, to be oustanding.
3. The man who is to instruct, inform, guide, and stimulate a given district should not be resident therein, but should not be so far removed from it as to make access to it difficult or time-consuming.
4. Expenses should be provided.
5. Constant communication of district directors with central office and with council and state journal could complete the liaison.
6. Other necessary details could be worked out.

If I were a man of sufficient means I would gladly undertake the work without fee as a contribution to the profession upon whom the proper guarding and supervision of the health of the individual and the commonwealth depends, but even a $1 per year man would be beset by more difficulties than would confront a properly chosen group. There are many who would contend with the policy of an individual as always expressed by him when they would accept and coöperate with the combined efforts or declarations of several.

The practice of medicine has been almost a religion to me, and I wish, as you do, at all times to be of use to it in the largest sense. We must admit, however, reluctantly, that the profession which earnestly we seek to adorn is easily confounded from within, suffers much from hasty conclusions of approval or the lack of it, and is constantly baffled by deadly apathy and nameless distrust. We are, therefore, aware that the only road for us to follow must lead directly to a goal of unanimity and obliteration of discord. The question, whether one individual or several could best accomplish the needs of the association must be given very serious consideration.

With warmest regards, I am

Most sincerely yours,

DANIEL CROSBY.

CALIFORNIA MEDICAL ASSOCIATION CANCER COMMISSION

Pathology Committee.—The northern California section of the Pathology Committee met in San Francisco November 24 and undertook the compilation of a "Pathological Dictionary," covering the name, synonyms, definition, and behavior of each of the ordinary types of tumor. This should fill a long-felt need in the clarification of the present confused nomenclature. The committee has also in preparation a standard form of report of tissue examination.

Clinical Committee Work.—A detailed and extremely comprehensive questionnaire on all aspects of pathology and diagnosis and treatment of gynecological malignancies is now in the hands of the members of the Committee on Gynecological Tumors, and a report based upon this study will shortly be ready for submission to the general Committee of Reference.

A similar report is ready for distribution to the Committee on Breast Tumors.

Program at Pasadena Meeting.—The Council of the California Medical Association has allocated the major part of the program of one of the three general meetings at the Pasadena convention to cancer. Dr. Robert B. Greenough of Boston, chairman of the Harvard Cancer Commission, has accepted an invitation to address this meeting; and other features of interest are being prepared by the Cancer Commission.

Increase in Cancer Death Rates.—Charts received from the American Society for the Control of Cancer, covering the registration area in the United States, show that, among all causes of death, cancer has risen from sixth place in 1900 (rate sixty-three per one-hundred thousand) to second place in 1930 (rate ninety-six per one hundred thousand).

Tables just compiled by the California Tuberculosis Association for this state show, in 1930, cancer death rate to be 118 per 100,000, over 20 per cent higher than that for the United States. Returns for the first six months of 1931 indicate a still higher rate.

*Cancer Literature Available.***—The American Society for the Control of Cancer (25 West Forty-third Street, New York City) offers free to physicians for distribution to patients copies of its educational pamphlets, including the following:

"What Everyone Should Know About Cancer"—a brief statement of the nature, diagnosis and treatment of cancer for the layman.

"The Doctor and the Cancer Patient"—a very clear, concise and pertinent summary by James Ewing, well worth every physician's time to read and suitable for the intelligent layman.

"Cancer of the Mouth" by James Ewing.

"Cancer in Women."

"Important Facts for Women About Tumors."

"The Rôle of the Nurse in Cancer Control."

"The Prevention of Cancer" by James Ewing.

"A Message to You"—a two-page leaflet suitable for enclosure in correspondence to patients.

THE WOMAN'S AUXILIARY OF THE CALIFORNIA MEDICAL ASSOCIATION*

Official Notice: Prize Competition

The state board of the Womans Auxiliary is offering prizes of $25, $15, and $5 for the three best papers on the subject of "Educating a Doctor's Wife." This contest is open to any doctor in California who is in

* As county auxiliaries to the Woman's Auxiliary of the California Medical Association are formed, the names of their officers should be forwarded to Mrs. Louis H. Dyke, Chairman of Publicity and Publications Committee. Brief reports of county auxiliary meetings will be welcomed by Mrs. Dyke and must be sent to her before publication takes place in this column. For lists of state and county officers, see advertising page 6. The Council of the California Medical Association has instructed the editors to allocate one page in every issue for Woman's Auxiliary notes.

** Any of this material may be obtained by writing direct to the Society.

good standing in the state society, his wife, and children. Maximum number of words is five hundred; minimum number is two hundred. Papers should be sent to Mrs. W. H. Sargent, 109 Beechwood Drive, Oakland, not later than March 31, 1932. The names of the judges will be announced in CALIFORNIA AND WESTERN MEDICINE. The winning papers will be read at the convention in April.

Component Auxiliary Societies

Los Angeles County

The annual meeting of the Woman's Auxiliary of the Los Angeles County Medical Association was held at 2:30 p. m. on Thursday, December 17, at the home of Mrs. William T. McArthur, 2025 South Western Avenue, Los Angeles. Following the business meeting and election of officers, a program of unusual musical interest was presented by Miss Marguerite Kuehne, violinist; Mrs. Martha D'Arc, soprano; and Anna Heloise, concert dancer. Members of the auxiliary remained for tea as the guests of Mrs. McArthur.

* * *

Orange County

The Woman's Auxiliary of the Orange County Medical Association held its October meeting at the Santa Ana Country Club.

The doctors were the guests of honor at a dinner, with several unique and original features. Programs were written in the form of prescriptions; favors for the women, in the form of a small telephone with numbers indicating their places, while those for the doctors were small physicians' bags fully equipped with stethoscope and similar supplies, all fashioned from candy by Mrs. F. Leroy Chapline of Orange.

Following special music by Mrs. Ruth Frothingham and her Spanish Orchestra, Mrs. Coulter opened the after-dinner program with "Symptoms and Diagnosis of the Orange County Medical Association," prescribing the treatment found on the prescription blanks with Mrs. Dexter Ball as "pharmacist."

Others who took part in this interesting program were: Mrs. R. A. Cushman, who gave "Spirits of Welcome"; Dr. J. Luther Maroon, who substituted for Dr. E. J. Steen of Fullerton; and Mrs. James S. Percy of Los Angeles, second vice-president of the national; junior past president of the California, and president of the Los Angeles auxiliaries.

The final number on the program was a most interesting talk by Lieutenant Rex E. Walsh, head of the chemistry department in crime investigation of the Los Angeles police force, assisted by Captain Hopkins and Herman Zabel, finger-print experts, who brought photographs of special cases which have aroused nation-wide interest.

One hundred attended this most delightful evening.

* * *

Contra Costa County

The October meeting of the Woman's Auxiliary of the Contra Costa County Medical Association was held at the Hotel Carquinez in Richmond at the same time as the meeting of the medical society of the county.

The following officers were elected to serve for 1932, with Mrs. C. R. Blake, who was reëlected president; Mrs. S. N. Weil, first vice-president; Mrs. C. O. Bishop, second vice-president; Mrs. L. H. Fraser, secretary; Mrs. B. J. Harmon, treasurer.

Mrs. S. N. Weil gave a very interesting talk about a program she heard in Sacramento at the auxiliary to the Sacramento Medical Society, and especially stressed the paper given by the state president, Mrs. W. H. Sargent. Excerpts of this paper were included in the report in the October issue.

The new constitution was reread and a few corrections made.

Mrs. L. H. Fraser, presented a synopsis of a course of study which she thought would be of value for the auxiliary.

Mrs. Blake, the president, invited the auxiliary to hold the January meeting at her home, at which a tea will be given in honor of the state president, Mrs. Sargent, and the state secretary, Mrs. A. A. Alexander.

The auxiliary is to have a review of "Microbe Hunters" at a later date.

Message to Our Members From the National President, Mrs. A. B. McGlothlan

The reports of the chairmen of the various national committees of the state presidents indicate unmistakably to the auxiliary women everywhere that as doctors' wives we have a definite sphere of influence as members of lay women's organizations. As such we may form a strong bond between the medical profession and the lay public.

Because of this possibility we shall make every effort this year to strengthen our organization both in numbers and in quality of work done.

The greatest demand made upon us is for the right kind of source material for health programs, and for health program speakers.

We are attempting to supply this information through a selected packet of literature, assembled by the Bureau of Public Information of the American Medical Association; by leaflets on communicable diseases compiled from the best recent medical literature and approved by a member of our advisory committee appointed for that purpose; by the dissemination of leaflets on "Some Contributions of Modern Medicine to the World"; by announcement of the American Medical Association radio broadcasts; and by using our best energies to promote the circulation of *Hygeia.*

We ask that every doctor's wife read the recommendations concerning *Hygeia* made to the Woman's Auxiliary by the House of Delegates of the American Medical Association. It is found on page 2116 of the June 20 issue of *The Journal of the American Medical Association.*

We believe that one of the best services we can render to the medical profession is to make our state and national conventions so attractive that great numbers of our women will be induced to attend and will influence their husbands to come.

The recent meeting in Philadelphia showed that a convention can serve such a purpose. To this end we are already planning to make the convention in New Orleans the best yet, if possible, and we herewith invite all the doctors' wives to come and bring their husbands.

NEVADA STATE MEDICAL ASSOCIATION

A. C. OLMSTED, Wells.....President
O. HOVENDEN, McGill.....President-Elect
J. H. HASTINGS, Pioche.....First Vice-President
E. E. HAMER, Carson City.....Second Vice-President
HORACE J. BROWN, Reno.....Secretary

COMPONENT COUNTY SOCIETIES

WASHOE COUNTY

The Washoe County Medical Society met in the State Building on the evening of December 8, called to order by the president, Dr. E. L. Creveling.

In view of the fact that the society was honored by having as speaker for the evening Dr. Emil Holman, a member of the surgical division of Stanford School of Medicine who was to present an illustrated lecture, the usual routine of business was laid aside.

The speaker was introduced to a large and enthusiastic audience. Five men had driven from fifty to one hundred miles to be present, and the night was one of bad weather.

Doctor Holman's subject was "Fundamental Principles Underlying the Treatment of Intrapulmonary Abscesses and Persistent Bronchial Fistulae."

The doctor's lecture was envisioned to the audience by a large number of lantern slides.

The speaker brought out the single and multiple types of infection common to lung diseases, their mode of entrance into lung tissue and significance of localization. The review of the surgical procedures of the past ten years with comparative present-day surgical work was reviewed and reasons given why certain types of operations had been abandoned.

The necessity for bronchoscopy, roentgenograms, and accurate personal history, differentiation between types of cases requiring medical and surgical treatment, likewise postural treatment when practicable, were emphasized.

An interesting picture of the experimental introduction of septic and aseptic emboli into the lung was shown in the pictures. The aseptic emboli remained localized without pathology, whereas the penetration of tissue with destruction of substance was beautifully shown from introduction of septic substance. Septic lung emboli following operations in mouth and throat, such as teeth extraction and tonsillectomy, was dwelt upon. Mechanical aids in treating bronchiectasis with bronchoscope and postural position were illustrated.

The mechanics why certain lung cavities with fistulae remained unclosed were illustrated by diagrams.

In all, the speaker showed an aptitude for his lecture which was well received.

Following Doctor Holman's lecture, the society adjourned, but with the understanding that a called meeting is to be held later in the month for the election of officers and the annual Fellowship dinner.

THOMAS W. BATH, *Secretary.*

Nevada State Board of Medical Examiners

Dr. Edward E. Hamer, secretary of the Nevada State Board of Medical Examiners, reports seven physicians licensed by reciprocity with other states and two physicians licensed by the endorsement of credentials from June 13 to August 3, 1931. The following colleges were represented:

LICENSED BY RECIPROCITY

College	Year of Graduation	Reciprocity with
Cooper Medical College, San Francisco	(1907)	California
Hahnemann Medical College of the Pacific, San Francisco	(1914)	Washington
University of Louisville Medical Department	(1915)	Montana
Baltimore Medical College	(1895)	Penn.
University of Nebraska College of Medicine	(1925)	Nebraska
Memphis Hospital Medical College	(1910)	Mississippi
Licentiate of the Royal College of Physicians and the Royal College of Surgeons of Ireland	(1908)	California

ENDORSEMENT OF CREDENTIALS

College	Year of Grad.	Endorsement of
Columbia University College of Physicians and Surgeons	(1929)	N. B. M. Ex.
University of Toronto Faculty of Medicine	(1927)	N. B. M. Ex.

UTAH STATE MEDICAL ASSOCIATION

R. A. PEARSE, Brigham City.....President
F. M. McHUGH, Salt Lake City.....President-Elect
L. R. COWANS, Salt Lake City.....Secretary
J. U. GIESY, Kearns Building, Salt Lake City
.....Associate Editor for Utah

COMPONENT COUNTY SOCIETIES

SALT LAKE COUNTY

The last regular meeting of the Salt Lake County Medical Society was held on Monday evening, November 9, at the Saint Marks Hospital.

The meeting was called to order at 8:10 o'clock by Vice-President E. M. Neher. Thirty-six members and three visitors were present. The following clinical program was presented by members of the hospital staff: Undulent Fever, by F. S. Spencer; Tularemia, by H. B. Felts; Pseudohypertrophic Muscular Distrophy and Acute Anterior Poliomyelitis, by A. L. Huether; Gastric Ulcer and Acute Vegetative Endocarditis, by D. L. Barnard and O. Ogilvie. These cases were discussed by Major T. W. Burnett, J. W. Sugden, O. J. LaBarge, and G. Richards.

* * *

The last regular meeting of the Salt Lake County Medical Society was held on Friday evening, November 27, at the Newhouse Hotel.

The meeting was called to order by President F. M. McHugh at 8:05 o'clock. Sixty members and four visitors were present.

Dr. Albert Kuntz of the St. Louis University School of Medicine addressed the society upon "Visceral Sensitivity and Referred Pain." This paper was discussed by Doctors D. L. Barnard, E. L. LeCompte, R. Tandowsky, and W. F. Beer.

The application of Dr. Leon H. Cline was read and referred to the board of censors.

BARNET E. BONAR, *Secretary.*

WEBER COUNTY

The regular meeting of the Weber County Medical Society was held on November 19 at the Hotel Bigelow.

The election of officers for the coming year resulted in the following officers being unanimously elected by acclamation: W. S. Badcon, president; Vernon Ward, vice-president; William M. McKay, secretary; H. W. Nelson, treasurer.

An auditing committee was appointed, consisting of R. L. Drayer, chairman, with Junior Edward Rich and Leslie Smith as members.

Dr. W. D. Sansum of Santa Barbara was our guest speaker for the evening. He discussed underweight, indigestion, and allergy.

CONRAD H. JENSEN, *Secretary.*

IN MEMORIAM

Kerr, Archibald A. Died in Salt Lake City, December 5, 1931, age 62 years. Graduate of Rush Medical College, Chicago, 1896. Licensed to practice, 1897. Doctor Kerr was a member of the Salt Lake County Medical Society, the Utah State Medical Association, and the American Medical Association.

Utah Department of Registration

Mr. S. W. Golding, director of the Utah Department of Registration, reports the written examination held at Salt Lake City, June 30 to July 1, 1931. The examination covered ten subjects and included one hundred questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. Five physicians were licensed by reciprocity with other states, and three physicians were licensed by the endorsement of credentials, July 14, 1931. The following colleges were represented:

PASSED

College	Year of Grad.	Per Cent
State University of Iowa College of Medicine	(1930)	82.3
University of Louisville School of Medicine	(1930)	82.
Royal University of Bologna Faculty of Medicine and Surgery	(1930)*	78

LICENSED BY RECIPROCITY

College	Year of Grad.	Reciprocity with
Northwestern Univ. Medical School	(1931)	Idaho
Indiana University School of Medicine	(1917)	Louisiana
State University of Iowa College of Medicine	(1930)	Iowa
University of Louisville School of Medicine	(1930)	Kentucky
University of Pennsylvania School of Medicine	(1928)	Penn.

LICENSED BY ENDORSEMENT

College	Year of Grad.	Endorsement of
Washington Univ. School of Medicine	(1930)	N. B. M. Ex.
University of Pennsylvania School of Medicine	(1929), (1930)	N. B. M. Ex.

* Verification of graduation in process.

MISCELLANY

Under this department are ordinarily grouped: News; Medical Economics; Correspondence; Twenty-five Years Ago column; Department of Public Health; California Board of Medical Examiners; and other columns as occasion may warrant. Items for the News column must be furnished by the twentieth of the preceding month. For Book Reviews, see index on the front cover, under Miscellany.

NEWS

San Francisco Meeting Place of American College of Physicians.—Following a conference of the local arrangements committee of the American College of Physicians here, with the president of the organization in attendance, announcement was made by Dr. William Kerr, general chairman, that final plans have been approved for the sixteenth annual clinical meeting of the college, which is to be held in San Francisco, April 4 to 8, 1932.

The American College of Physicians is the largest society of physicians in America, and has approximately 3000 fellows and associate members. At the last meeting in Baltimore, Maryland, the attendance of members and guests totaled about 4000.

Doctor Kerr, who is professor of medicine at the University of California Medical School, welcomed the arrangements committee at the University Hospital. Dr. S. Marx White, professor of medicine at the University of Minnesota, and president of the college, came west especially to attend the conference.

Members of the committee on arrangements are: Dr. F. M. Pottenger, head of the Pottenger Tuberculosis Sanitarium at Monrovia, and president-elect of the college; Dr. Noble Wiley Jones, clinical professor of medicine at the University of Oregon, and regent of the college; Dr. Arthur Bloomfield, professor of medicine at Stanford Medical School; Dr. Walter M. Boardman, associate professor of medicine at Stanford Medical School; Dr. Russell V. Lee of Palo Alto; and four members of the University of California staff in addition to Doctor Kerr: Dr. Leroy H. Briggs, clinical professor; Dr. Ernest H. Falconer, clinical professor; Dr. H. Lisser, clinical professor, and governor of the northern California section of the College of Physicians; and Dr. C. L. A. Schmidt, professor of biochemistry.

Health Information on Radio.—The San Diego County Medical Society, under the auspices of the Committee on Public Policy and Legislation, has instituted a series of weekly health talks over station KFSD. These talks are being given every Wednesday morning from 10:15 to 10:30 and cover medical subjects of interest to the public generally. This educational program of the San Diego Society is being well received by the listeners within the range of the powerful local station. The program and manuscripts to be used are prepared and arranged in advance and cover the weekly broadcast periods until July 1, 1932.

Scripps Metabolic Clinic Lectures.—Dr. Llewellys F. Barker of Baltimore will deliver the annual Scripps Clinic lectures on January 7, 8 and 9, 1932. These lectures are given through the Scripps Clinic Lectureship Endowment for the members of the San Diego Medical Society. The clinics will be presented in the form of afternoon bedside clinics.

Officers for the Heart Committee.—At the annual meeting of the San Francisco Heart Committee, which was held at the San Francisco County Medical Society auditorium on Thursday, November 19, 1931, the following officers were elected: Arthur Bloomfield, chairman; Gordon E. Hein, vice-cahirman; Major W. C. Munly, secretary; J. Marion Read, assistant secretary.

New Publication on Coccidioidal Granuloma.—Coccidioidal granuloma has been a subject of study in California for the past forty years. Since 1928, when the disease was made reportable by the California State Board of Public Health, greater opportunities for research have been provided. A special bulletin which covers the work of the staff in the study of this disease together with historical material, reports of investigations, case reports and bibliography, has been issued by the State Board of Public Health.

Dr. Emmet Rixford, Emeritus Professor of Surgery of Stanford University School of Medicine, contributes an article upon the history of coccidioidal granuloma in California. Doctor Rixford was the first to discover the causative organism in California. Dr. Ernest C. Dickson, professor of Public Health and Preventive Medicine of Stanford University School of Medicine, contributes an article which covers more recent investigations. The bulletin consists of forty-three pages, together with a table outlining 256 case histories. It is illustrated with two maps showing the distribution of the disease in California and six half-tone illustrations. Copies of this bulletin, known as "Special Bulletin No. 57 Coccidioidal Granuloma," may be obtained by applying to the Director of the California State Department of Public Health, Sacramento.

American Board for Ophthalmic Examinations.—The American Board for Ophthalmic Examinations will hold an examination in New Orleans on Monday, May 9, 1932, at the time of the meeting of the American Medical Association.

Necessary applications for this examination can be procured from the secretary, Dr. William H. Wilder, 122 South Michigan Avenue, Chicago, and should be sent to him at least sixty days before the date of the examination.

In Whom Is Ownership of X-Ray Plates Vested? An interesting item concerning ownership and right of possession of roentgenograms was printed in *The Journal of the American Medical Association* of November 21, 1931. Because ownership and right of possession are questions that again and again come to the front in both hospital and private practice, the item is here reprinted. It reads as follows:

"The question whether the roentgenograms of a hospital patient belong to the patient or to the hospital was answered by a court for the first time, so far as is known, in Hurley Hospital vs. Gage," decided on appeal April 21 by the circuit court for the county of Genesee, Michigan. The patient had been roentgenographed in the roentgenographic department of the Hurley Hospital at Flint. The usual charge for the service was included in the patient's bill. He made a payment on account, but refused to pay the charge for the roentgenographic service unless the roentgenograms were delivered to him. The hospital refused to deliver them and sued the patient for the balance due. In the justice's court, where the suit was instituted, judgment was given against the hospital. The hospital, however, because of the principle involved, appealed to the circuit court of Genesee County. At the hearing on the appeal, no one appeared on behalf of the patient and the case was heard and judgment rendered without the submission of evidence or argument by him. In giving judgment, the court pointed out that the hospital sold and patients paid for, not the material that went into roentgenograms, but knowledge and experience. The protection of the hospital might depend largely on the proper preservation of the roentgenograms and, said the court, the films should remain in the hospital. Judgment was given against the patient for the balance due on his bill, covering the amount charged by the hospital for the roentgenograms."

* * *

Apropos of the above it may be stated that at the September meeting of the Council of the California

Medical Association this question was discussed at some length. Doctor Ullmann of Santa Barbara spoke of a card which he had used, and which had been found very useful.

The language on this card is being studied with an idea of making suggestions both to hospitals and physicians to adopt similar placards in connection with roentgenograms made for patients.

CORRESPONDENCE

Subject of the Following Letter: Notification of Loss of Diploma

California Medical Association,
450 Sutter Street,
San Francisco, California.

Gentlemen:

I wish to report the loss of my medical diploma from Vanderbilt University, class of June 1915, with endorsement thereon showing licensed in Alabama, and registered in Probate Court, Birmingham, Jefferson County. This diploma was contained in a grip stolen from my automobile.

Also, the original notice of State Board of Medical Examiners was lost, which stated having passed the State Board.

If it is possible, I wish you would in some manner insert this in an issue of your journal, as I wish to avoid the use of these papers by an imposter.

Thanking you for this kindness,

Gratefully yours,

O. M. SPENCER, M. D.,
Surgeon, United States Public Health Service.

COUNTY AND CITY HEALTH DEPARTMENT CONSOLIDATIONS

Comments on Excerpts From the Political Code of California

In the editorial section of this number of CALIFORNIA AND WESTERN MEDICINE are printed some comments on the affiliations and consolidations of city and county health departments. The following excerpts from a report discussing the state laws in relation to such consolidations indicate how such consolidations may be brought about.

Provision for consolidation of certain functions of the city government of Los Angeles City with appropriate functions of the county government are as follows (Charter of the city of Los Angeles):

"Section 2 (t)—to transfer or consolidate functions of the city government to or with appropriate functions of the state or county government, or to make use of such functions of the state or county government, and in the case of any such transfer or consolidation the provisions of this charter providing for the function of the city government so transferred or consolidated shall be deemed suspended during the continuation of such transfer or consolidation, to the extent that such suspension is made necessary or convenient by said transfer or consolidation and is set forth in the ordinance establishing such transfer or consolidation, and any such transfer or consolidation may be repealed by ordinance, which repeal will terminate the suspension of the provisions of the charter hereinabove provided for;"

Various city governments have been effecting the transfer of health functions to the county health officer since 1919 until now there are thirty-six cities working under agreement with the Board of Supervisors. This is provided for in Section 4225a, Political Code, 1919 enactment, as follows:

"The board of supervisors of any county wherein a county health officer has been appointed under the provisions of section four thousand and two hundred twenty-five of the Political Code shall have power to contract with any incorporated city or town or chartered city within such county, and such incorporated city, town or chartered city therein, through its board of trustees, council or other legislative body, shall have power to contract with such county for the performance by health officers or other employees of health departments of any or all functions relating to public health. Whenever such contract has been duly entered into, the county health officer and his deputies shall thereupon exercise the same powers and duties within such city or town or chartered city as are conferred upon health officers thereof by state law and local ordinance within such city or county. In any such contract the city, town or chartered city shall have power and authority to provide for the payment by such incorporated city or town or chartered city, to the county of such consideration as may be agreed upon, the same to be paid to the county treasurer of the county.

"Said contracts may further provide for the care and support, including medical attendance, of indigent sick, and for compensation therefor."

It is therefore plain that a City Council may by ordinance transfer the functions relating to public health to a County Board of Supervisors and that a County Board of Supervisors may enter into a contract for the payment by a city located within the boundaries of the county of such sums as may be agreed upon for such services.

CALIFORNIA NURSES ASSOCIATION RESOLUTIONS

Recommendations Regarding Notification of Service Rules

At a meeting of the board of directors of the California Nurses' Association, held on November 7, 1931, the following resolutions were adopted:

Resolution

Whereas, An unprecedented situation in nursing has been created by the world-wide economic stress of the past two years whereby many people have been unable to pay for nursing service either in the hospital or in their homes; and

Whereas, Nurses in large numbers are unable to obtain employment and thereby unable to perform the nursing service for which they have been fitted; and

Whereas, The proportion of nurses in private nursing exceeds greatly the demands for private nurses; and

Whereas, The number of students in accredited schools of nursing are even in excess of the number of the previous year; now therefore be it

Resolved, That we recommend to each district of the California State Nurses' Association that a study shall be made by a special committee composed of physicians, nurses, and lay people of the community to ascertain the conditions of nursing service within the district to the end that means may be established to adequately care for the sick, both in the hospital and in the home, according to the capacity of the sick to pay for this service.

Resolved, We further recommend that nurses will individually consider the situation and in cases where need is evident will in all tolerance seek to supply this need for nursing service at a charge that is compatible with fairness to the sick and to themselves. We have in mind the ability of the patient to pay a reasonable sum, the necessary financial support of the nurse and the encouragement of the nurse to use her own judgment.

Resolved, We further recommend to nurses that they will avoid registering against any special type of cases; that they make a study of the real cause of such practice to determine if it may be removed by further preparation.

Resolved, We further recommend that nurses will consider the type and degree of nursing required in the hospital and the home and the arrangements that may be made as to rest and schedule of hours, doing all in their power to meet the need in each case as an individual matter.

* * *

Moved Further, That a request be made to have these resolutions published in California and Western Medicine.

TWENTY-FIVE YEARS AGO*

EXCERPTS FROM OUR STATE MEDICAL JOURNAL

Volume V, No. 1, January 1907

From some editorial notes:

Fifth Volume.—The present number begins the fifth volume of the State Journal. It is somewhat less bulky than the January number of a year ago, for the reason that we have not recovered from the crippling catastrophe of last April; but during the year we trust that conditions will so materially improve that the additional number of reading pages may be added. However, if we are not quite so comfortably situated as we were a year ago, we have at least as much con-

* This column strives to mirror the work and aims of colleagues who bore the brunt of state society work some twenty-five years ago. It is hoped that such presentation will be of interest to both old and recent members.

fidence in the future and at least as much potential energy. This year and succeeding years will develop many problems of interest and importance to our profession, and will find for each one of us ample work. The broad plan of organization of the medical profession is at last shown to be distinctly successful. In all parts of the United States, medical societies are increasing their growth and their strength, and are becoming, as it were, crystallized. Instead of wandering each his own way through life, we, as physicians, are awakening to the fact that we have many important duties, and that in many directions these have been forgotten or unrecognized in the past. As our profession is brought more and more into harmony, we recognize more and more clearly the great harm that has resulted to the public through our own apathy in the past. . . .

We Are Gullible.—Truly, we are indeed a gullible and a forgetful people. We will be intensely indignant today, and tomorrow forget what it was all about. We will believe a published lie that we read today, and next week we will read another one about the same thing, but diametrically opposed; and again will we believe that. We have come to regard the most exaggerated and impossible statements of manufacturers as privileged communications whose truth should be depended upon. . . .

From an article on "A Combination of Syphilis and Epithelioma of the Tongue" by Douglass W. Montgomery, M. D., San Francisco, and H. M. Sherman, M. D., San Francisco.

The interesting points in the following case are the combination of two important diseases such as syphilis and epithelioma in the same lesion, and the elicitation of an interesting history of unsuspected syphilis.

From an article on "The Diagnosis of Some Lung Conditions Requiring Surgical Interference" by George H. Evans, M. D., San Francisco.

To cover, in the most practical way, the above subject within the lines of a brief paper, it will be necessary to confine its limits to a consideration of some of the conditions technically within its title. . . .

From an article on "The Social Evil, Its Cost and Control" by George H. Aiken, M. D., Fresno.

For the purpose of this paper I would define the term "social evil" as open and recognized prostitution in a community, including venereal diseases and their pernicious effects. . . .

Its Control, How and by Whom?—That prostitution is one of the most destructive and pernicious evils known to the human race, no thoughtful or sane person can deny; that it is an absolutely necessary evil, essential to the health, happiness and well-being of mankind, deserving of recognition, and legal sanction, no one dare admit; but while it is an evil, and a terrible one, it is a condition which exists in nearly every city in the land, and probably will continue to exist to the end of time, and the question of the hour is, what shall be done with it?

From an article on "The Physician's Responsibility for the Nostrum Evil" by Richard C. Cabot, M. D., Boston.

As physicians we are largely responsible for the sale of secret remedies. We help to create the demand. We feed it. . . .

. . . The "patent medicine" and nostrum industry will be seriously crippled when we do two things:

(a) Stop advising secret remedies which may be poisonous or inert.

(b) Stop fooling our patients with placebos.

The positive side of all this negative advice I have tried to explain in another paper.

DEPARTMENT OF PUBLIC HEALTH

By Giles S. Porter, M. D.
Director

California Cares for Crippled Children.—For three years, the California State Board of Public Health has been working in the interest of crippled children whose parents or guardians are unable to provide necessary treatment for the relief of their physical handicaps.

During the three years that the law has been operative in California, 266 crippled children have received treatment under the provisions of this act, and the surveys conducted by the department have located no less than 3345 crippled children within the state. Since work under this act was inaugurated more than 2000 home visits or investigations of cases have been made in fifty-one of the fifty-eight counties of the state. Repeated visits to the hospitals for crippled children and convalescent homes together with many special surveys, particularly of paralyzed children whose paralysis resulted from epidemic poliomyelitis, have been made.

Widespread epidemics of poliomyelitis occurred in California in 1927 and 1930, with a considerable number of cases reported in 1928. In 1927, 1270 cases of this disease were reported from fifty-five counties. Of these, there were residual paralyses in 316 cases, all of which were in patients living in small towns in rural districts of the state. In 1928, 154 cases out of a total of 301 which were reported showed residual paralyses. All of these patients were located in rural districts of the state. As a matter of fact, cases in the large cities where orthopedic hospitals and well organized health departments function, were not covered in the surveys made by the state.

In 1930, out of a total of 1905 cases reported, residual paralyses was found in 709 patients.

These figures indicate the importance of the Crippled Children's Act in the rehabilitation of children who suffer paralysis following epidemic poliomyelitis. Under the provisions of the act a total of 266 children have been provided with treatment. Through the results of the treatments, nearly all of these children have been rehabilitated, thereby relieving the state and the local community from possible expenses which might result from indigence brought about through unrelieved physical handicaps.

Vital Statistics Registration Law Amended.—Prior to the passage of Chapter 936 of the Statutes of 1931, only health officers of chartered cities of five thousand or more inhabitants were local registrars of vital statistics. Within recent years the registration of vital statistics has acquired a greater public health significance than formerly, when the legal phase of registration was of paramount importance. At the present time health officers desire the information contained upon these certificates, especially those for death, in order that they may analyze the factors operative in causing death, and incidentally ill health, in their community.

By this new amendment to our law, county health officers who hold contracts with cities of five thousand or more population, become by law the local registrars of vital statistics in that city. By coöperating with the full time county health officers in the state, the rural territory under their supervision is gradually being given to them for the registration of vital statistics, as well as all other health supervision. On the whole we find such an arrangement very satisfactory, and we believe that it will ultimately increase the proportion of certificates registered, especially for births.

The new law is mainly operative in Los Angeles County where there is a strong, well-organized county health department under the supervision of Dr. John

L. Pomeroy. On October 1, Doctor Pomeroy took over the registration of vital statistics in the following cities: Alhambra, Arcadia, Bell, Belvedere, Compton, Glendale, Hawthorne, Hermosa Beach, Huntington Park, Inglewood, Lynwood, Maywood, Monrovia, Montebello, Monterey Park, Pomona, Redondo Beach, San Fernando, San Gabriel, San Marino, Santa Monica, South Gate, Torrance and Whittier. In sixteen of these cities the deputies of the county health officer were acting as deputy registrars of vital statistics by agreement, but these are now legally under the supervision of the county health officer himself which will lead to uniformity and improved registration. This is somewhat noticeable at the present, even though the law has been in effect such a short time. Besides these cities, the unincorporated areas surrounding Compton, Glendale, Inglewood, Monrovia, Pomona, Redondo Beach, Santa Monica have been given to the county health officer. This is not such a change, as they were formerly administered by the district health officers. The rural territory surrounding San Gabriel and Whittier have also been added to the territory supervised by Doctor Pomeroy.

There are other counties in the state where this law is applicable, but these counties as a whole are not so well organized to care for the registration of vital statistics. In some places there is not help enough in the health department, and other arrangements have to be made, but in almost all cases the health officer is glad of the opportunity to be able to thus check his work. The cities affected by this law are listed below:

Martinez, Contra Costa County, Dr. I. O. Church, Martinez.

El Centro, Imperial County, Dr. Warren Fox, El Centro.

Monterey, Monterey County, Dr. R. M. Fortier, Salinas.

Pacific Grove, Monterey County, Dr. R. M. Fortier, Salinas.

Anaheim, Orange County, Dr. K. H. Sutherland, Santa Ana.

Fullerton, Orange County, Dr. K. H. Sutherland, Santa Ana.

Orange, Orange County, Dr. K. H. Sutherland, Santa Ana.

Santa Ana, Orange County, Dr. K. H. Sutherland, Santa Ana.

National City, San Diego County.—Dr. Alex M. Lesem, San Diego.

Lodi, San Joaquin County, Dr. John J. Sippy, Stockton.

Stockton, San Joaquin County, Dr. John J. Sippy, Stockton.

Santa Maria, Santa Barbara County, Dr. R. C. Main, Santa Barbara.

Santa Clara, Santa Clara County, Dr. C. M. Burchfiel, San Jose.

Oxnard, Ventura County, Dr. J. A. King, Ojai.

Santa Paula, Ventura County, Dr. J. A. King, Ojai.

Trichinosis from Bear Meat.—Trichinosis is generally contracted through the consumption of infected raw pork meat. Cases of trichinosis from use of bear meat are not common. A small group of cases contracted from such meat was reported in California last year, and during the present month a larger group of cases due to this source has been reported.

On September 16 a Vallejo youth killed a bear in Trinity County. A number of people ate steaks, roast and liver from the bear and the remainder was jerked and smoked. A San Francisco man took a portion of the jerked meat home with him and the remainder was brought to Vallejo. This meat was distributed among families in Vallejo, San Francisco and Oakdale. As a result of eating this jerked bear meat sixteen cases of trichinosis have been reported. The youth who shot the bear died October 13. Cases from this source occurred in Vallejo, San Francisco and Oakdale. Some of the cases are extremely severe and it is possible that more fatalities will result. A sample of the meat sent to the state laboratory was found positive for trichinella spiralis. As a matter of safety it would appear that all bear meat should be thoroughly cooked before eating.

BOARD OF MEDICAL EXAMINERS OF THE STATE OF CALIFORNIA

By CHARLES B. PINKHAM, M. D.
Secretary

Results of Board of Medical Examiners' Examination Sacramento, October 20 to 22, 1931

Charles B. Pinkham, M. D., secretary of the California Board of Medical Examiners, reports the written examination held in Sacramento October 20 to 22, 1931.

The following medical colleges were represented:

PASSED

College	Year of Graduation	Per Cent
Baylor University College of Medicine	(1930)	84 6/9
College of Medical Evangelists	(1931)	80 7/9, 84 8/9, 79 3/9, 80, 83 1/9
Cornell University Medical College	(1931)	82 8/9
Creighton Medical College	(1931)	84 6/9, 84 6/9, 79 2/9, 77 2/9, 79 1/9
M. R. C. S., England	(1908)	78
L. R. C. P., London	(1908)	
Harvard University Medical School	(1926)	86 4/9
	(1930)	83 2/9
Indiana University School of Medicine	(1930)	86 8/9
Northwestern University Med. School	(1930)	85 2/9
	(1931)	78 5/9
New York Homeopathic Medical College and Flower Hospital	(1930)	85
Rush Medical College	(1928)	83 1/9
	(1929) 75 3/9, (1931) 85 8/9	
St. Louis University School of Medicine	(1929)	78 3/9
	(1930)	80 1/9, 82 7/9
Stanford University School of Med.	(1929)	85 2/9
	(1931) 82 8/9, 86 7/9, 80 3/9	
University of Amsterdam Medical Faculty, Holland	(1901)	*74 1/9, 17 % for yrs. of practice Total 91 1/9
University of Colorado School of Medicine	(1931)	85 8/9, 85 7/9 86 5/9
University of Edinburgh Faculty of Medicine, Scotland	(1918)	*72 6/9, 4 % for yrs. of practice Total 76 6/9
University of Irkoutsk Medical Faculty, Russia	(1923)	*74 2/9, 5 % for yrs. of practice Total 79 2/9
University of Manitoba Faculty of Medicine, Canada	(1924)	76 3/9
University of Nebraska College of Medicine	(1930)	84 6/9
University of Oregon Medical School	(1930)	77 5/9
University of Tennessee College of Medicine	(1930)	79 4/9
University of Wisconsin Med. School	(1928)	84 4/9
	(1931)	87 7/9

FAILED

Kentucky University Medical Department	(1904)	53 3/9
University of Bordeaux Faculty of Medicine, France	(1930)	68
University of Illinois College of Medicine	(1931)	72 7/9
Washington University School of Medicine	(1929)	72 5/9

LIST OF THE SUCCESSFUL APPLICANTS

William Lyle Allred, San Francisco.
Ray Cook Atkinson, Oakland.
Wilbur Clifton Batson, Westwood.
Charles Benninger, Jr., San Francisco.
Frederick Sweet Bruckman, San Francisco.
Alfred John Cantoni, San Diego.
Gladys Clara Carleton, Inglewood.
Cecil Crafts Cole, Long Beach.
George Horace Coshow, Santa Barbara.
Clarence Edmund Crowley, Jr., Santa Maria.
John R. Daly, San Francisco.
Horace Welles Doty, Los Angeles.

*Credit for years of practice.

Thomas Jefferson Dozier, San Leandro.
Albert R. Egan, San Francisco.
Henry Gibbons III, San Francisco.
Kenneth William Gordon, Los Angeles.
Alfred George Huenergardt, Los Angeles.
Clarence Walter Kilcher, Los Angeles.
Orval LeRoy Kirkle, Los Angeles.
Axel Ludwig Lindberg, Los Angeles.
Everette Lee Lochen, San Francisco.
James Anthony McHugh, Stockton.
Patrick Henry McHugh, Sacramento.
Edwin Ewart McNiel, San Leandro.
Willard Merle Meininger, San Francisco.
John Johnston Miller, Jr., San Francisco.
John Howard Moe, Stockton.
Albert Daniel Neubert, Fort Dodge, Iowa.
Clayton Hall Palmer, Los Angeles.
Richard Kenneth Pierce, Los Angeles.
Robert Paul Quirmbach, San Francisco.
James William Ravenscroft, San Diego.
Erving Lysander Rogers, Laguna Beach.
Ambrose Joseph Ryan, Sacramento.
Cornelis Schagen, Oakland.
Alfred Joseph Schwarz, San Francisco.
John Taylor Steele, San Francisco.
Olga Constantinova Turitsina-Lordkipanidze, San Francisco.
Richard Joseph Wagner, San Francisco.
Henry Ludwig Wollenweber, Los Angeles.
†Alfred Henry Valentine St. John.

News Items, January 1932

On November 20 Governor Rolph announced the appointment of Burt S. Stevens, M. D., San Francisco, as a member of the Board of Medical Examiners, vice H. A. L. Ryfkogel, M. D., term expired.

"The Arrowhead Remedies Company of Chico, headed by Williams Jennings Conway, 'Indian herb doctor,' was today without a permit to issue its capital stock. Organized recently with a capitalization of $25,000, the company has been denied a permit by the State Division of Corporations to issue stock to its incorporators in exchange for assets. . . . In a statement summarizing the results of an investigation of the case, the Corporation Division remarks: 'From the information that has been obtained from sources outside the application, it appears this corporation has been formed for the purpose of enabling Conway to avoid further difficulties with the State Medical Board.' . . . The Attorney-General recently advised the Corporation office it could use its discretion on Conway's case in either approving or denying the application to issue stock" (Sacramento *Bee*, November 24, 1931).

Reports relate that S. L. Chong, Chinese herbalist, on November 17, 1931, in the Police Court of Fresno, California, pleaded guilty to a violation of the Medical Practice Act and was sentenced to serve 180 days in the county jail, commitment being withheld pending his good behavior and that he no longer violate the Medical Practice Act.

"M. E. Chow, Fresno herb doctor, was fined $100 yesterday by Police Judge James G. Crichton on a charge of violating the State Medical Practice Act" (Fresno *Bee*, November 20, 1931).

The eyesight swindlers have evidently transferred their attentions to the State of Washington, judging from a report in the December issue of *The Health Messenger*, published by the Public Health League of Washington, wherein is related that "A man calling himself 'Dr. Harry Chandler Coby, Oregon State Specialist of Portland State Hospital, Oregon, and having an office in Olympia,' called at the residence of R. H. Might, Joyce (Clallam County, Washington), examined his eyes and told Might that he had a 'transparent cataract.' Might was persuaded to go to Portland to have it removed, upon being told that blindness would inevitably result if he did not do this. Mr. Might, in making complaint, says: 'Then after some conversation he removed what appeared to be a piece of rubber from the eyeball and said his charges were $150.' He actually was paid $65. Needless to say, no one by the name of Coby is licensed to practice any of the healing arts in this State, nor connected with the Portland Hospital." The many pending California felony warrants evidently have discouraged activities of the eyesight swindlers in this State.

Reports relate that C. P. Tom, Chinese herbalist, pleaded guilty in the Justice Court, San Luis Obispo, on December 3 to a charge of violation of the Medical Practice Act and was sentenced to serve sixty days in the county jail, sentence suspended on condition that he no further violate the law.

The Investigation Department reported that Ysai Yeck, Chinese herbalist, pleaded guilty in police court, Fresno, on November 18 to a charge of violation of the Medical Practice Act, and paid a fine of $100.

†Final disposition withheld pending completion of application.

A New Era.—In October, 1923, St. Louis and Missouri supplied front-page news for the press of the country when the St. Louis *Star* exposed the medical diploma mill which had its headquarters in the St. Louis College of Physicians and Surgeons. Here one could buy a diploma for whatever sum he might scrape together. Ultimately, the Missouri Supreme Court revoked the charter of the school for fraudulent practices. Another school in Missouri was involved in the medical diploma mill, the Kansas City University of Physicians and Surgeons and the Supreme Court revoked the charter of that school on similar grounds. The ink was scarcely dry on the mandates of the court before new charters had been obtained.

Eight years later, that is to say, in October 1931, a petition was filed with Honorable William H. Killoren, Judge of Division 5 of the Circuit Court of St. Louis, asking that a pro forma decree of incorporation be granted the National College of Medicine and Surgery in St. Louis. Judge Killoren appointed former Judge Harry E. Sprague amicus curiae and to Judge Sprague may be accredited the inauguration of the new era. It is not front-page stuff, but to the medical profession it is a most gratifying indication that our efforts to clean up the medical college field have not been fruitless. The issuance of a pro forma decree of incorporation of a philanthropic or educational institution has hitherto been a very perfunctory action by the courts. When, however, Judge Sprague read the petition for the incorporation of a medical school which frankly stated that the intention of the petitioners was to establish a low grade or grade B school he was mindful of the incalculable damage that the people had suffered by the machinations of the owners of the two schools whose charters had been revoked. Instead, therefore of pursuing the usual tactics of the amicus curiae and putting his o. k. on the petition after a cursory examination he made a searching investigation of both the petitioners and of the purposes of the college.

In his exhaustive investigation Judge Sprague questioned the petitioners most searchingly; he also conferred with the officers of the Missouri State Medical Association and the St. Louis Medical Society and with Dr. E. P. North, St. Louis, a member of the Council on Medical Education and Hospitals of the American Medical Association, and Dr. James Stewart, Jefferson City, secretary of the state board of health. He found that none of these organizations recognized a class B medical school; that if the decree were issued and the school became established it would then be investigated and rated according to the minimum standards of the American Medical Association and the state board of health; that if the school failed to meet these minimum standards it would not be approved by the American Medical Association nor by the state board of health; that, in such event, the graduates, if any, would be debarred from taking the examination for a license in practically all the states in this country.

Under these circumstances Judge Sprague recommended to the court that the decree be not issued.—*Journal of the Missouri State Medical Association.*